United States Patent

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[33] **Canada**
[31] **044,256**

[54] **AUTOMATIC STACKING MACHINE**
22 Claims, 11 Drawing Figs.

[52] **U.S. Cl.** **93/93,** 198/35, 214/6, 214/6.5
[51] **Int. Cl.** **B65h 33/00**
[50] **Field of Search** ..... 93/93, 93.3; 198/35; 214/6.5, 6 M

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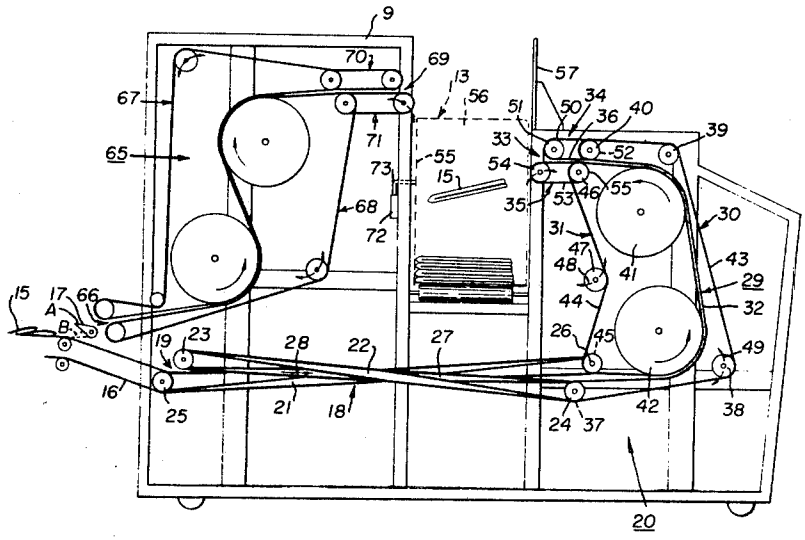
Primary Examiner—Bernard Stickney
Attorney—Stevens, Davis, Miller and Mosher

ABSTRACT: A machine for stacking newspapers and the like articles in which the incoming articles are counted and a predetermined number diverted to a first and to a second conveyor for ejecting the articles in a stacking bucket from opposite sides thereof. The articles are conveyed more rapidly on one of the conveyors to be stacked in a predetermined manner in the bucket and to permit unloading of the stack without stopping the incoming articles on the conveyors.



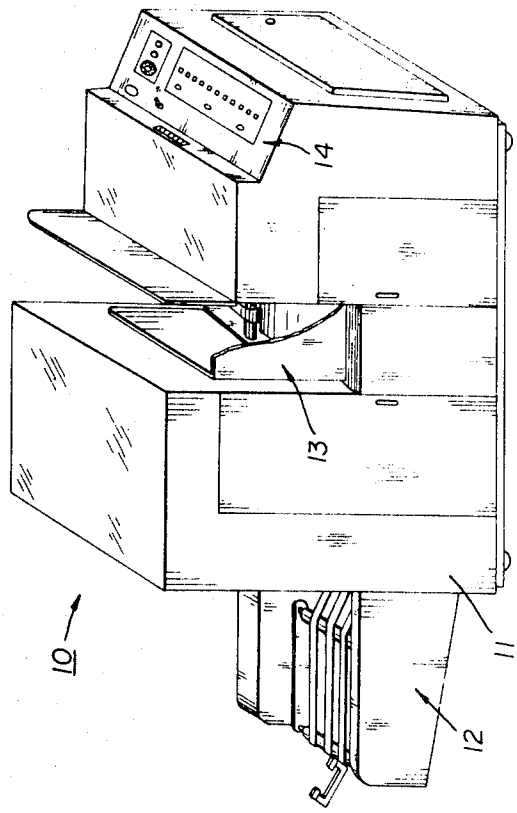
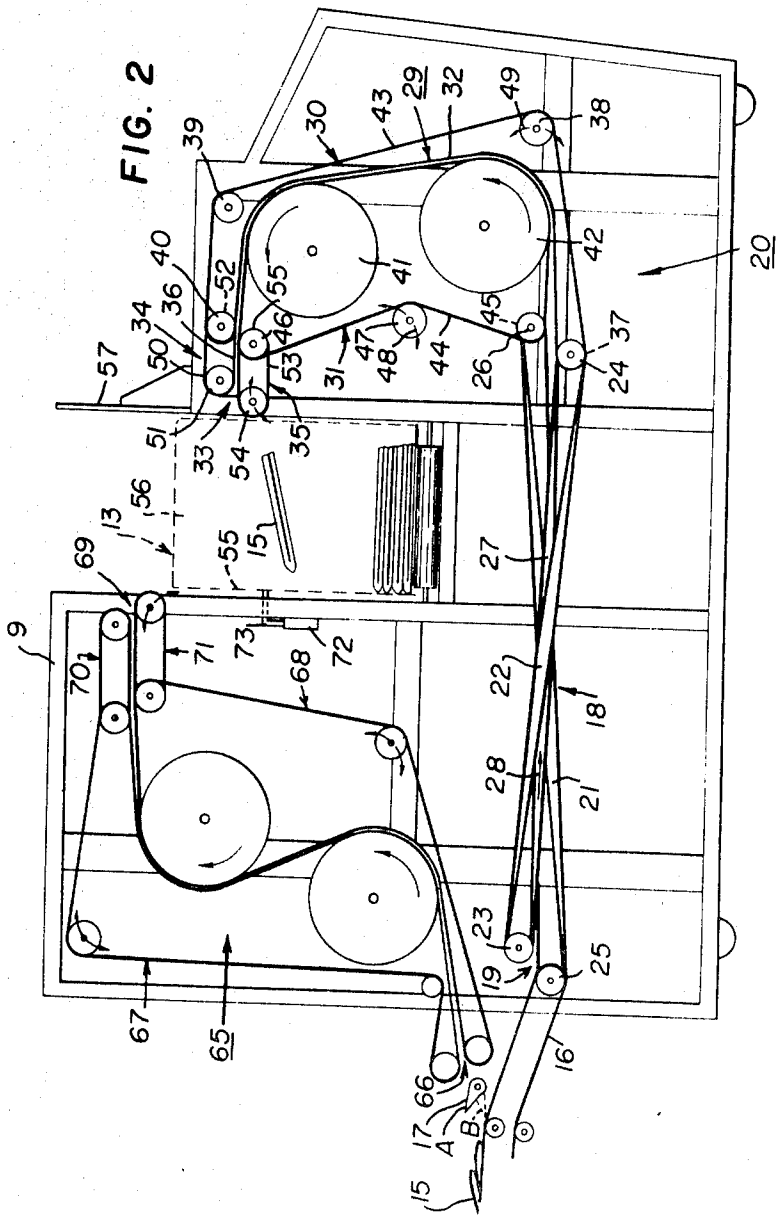


FIG. 1

FIG. 2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57
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31
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26
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33
54
35
56
13
55
15
27
69
9
71
73
68
72
70
22
18
28
21
23
19
25
67
65
16
66
17
A
B
15

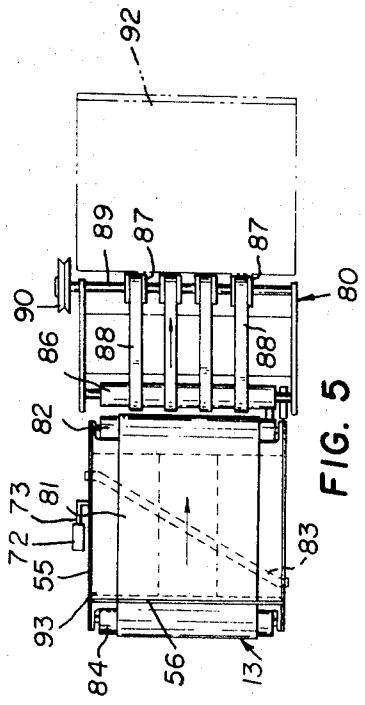


FIG. 5

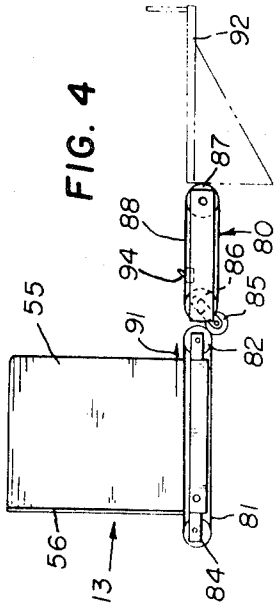


FIG. 4

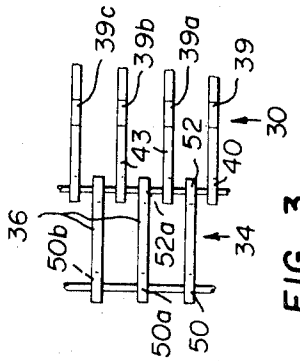


FIG. 3

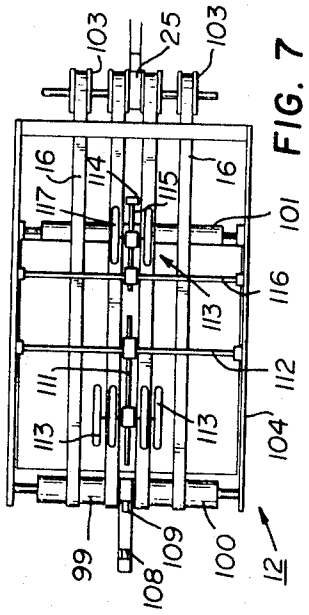

103
25
103
16
114
117
115
16
101
116
113
112
111
113
113
104
99
109
100
108
12

FIG. 7

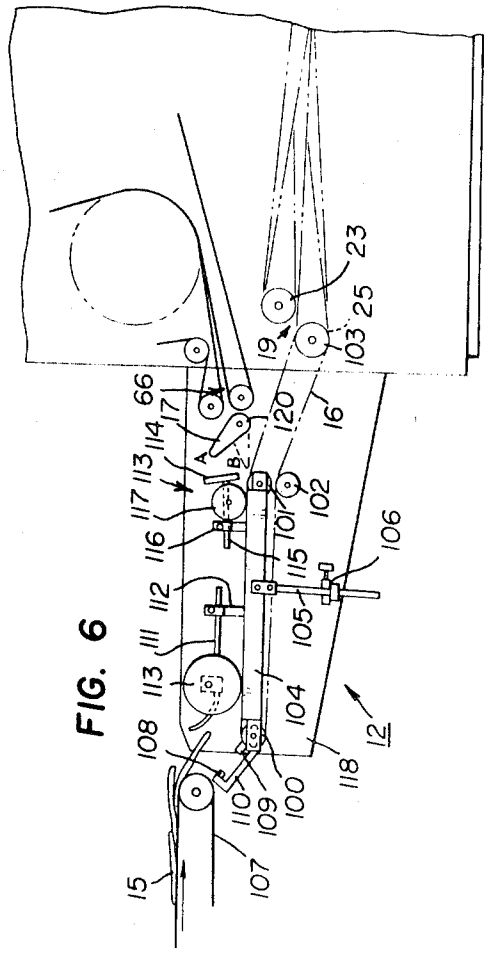

23
25
103
19
66
17
114
120
16
A
B
113
117
102
101
116
115
106
112
105
111
113
104
108
12
118
110
109
100
15
107

FIG. 6

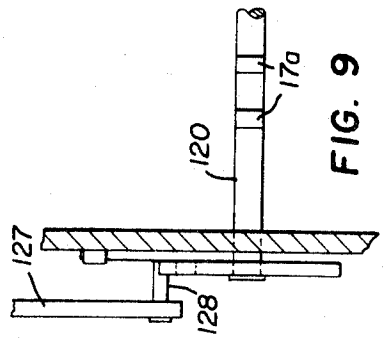
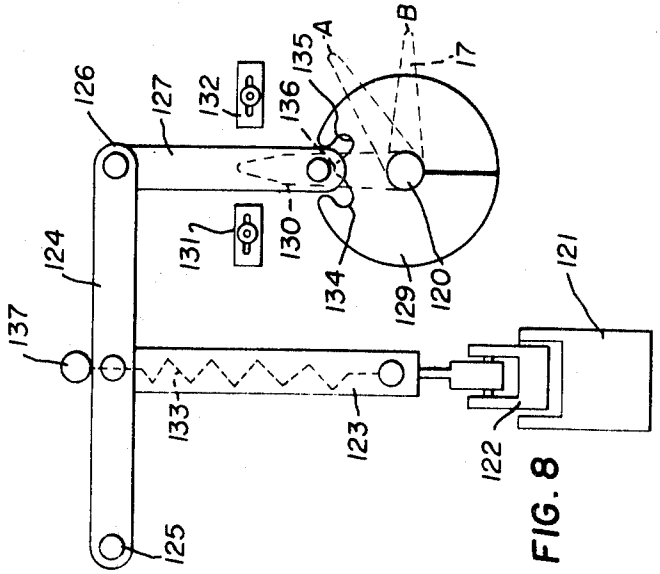

17a
120
127
128

FIG. 9


126
127
132
135
A
B
17
136
131
130
134
129
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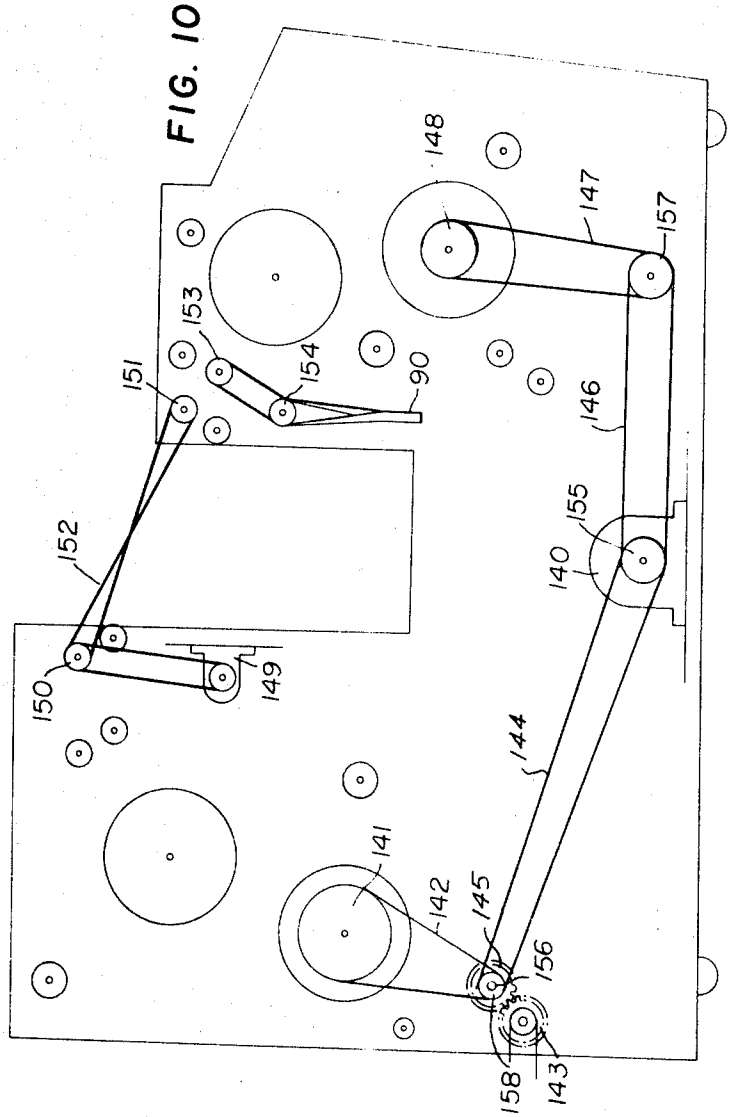
121
137
133
123
122
125

FIG. 8

FIG. 10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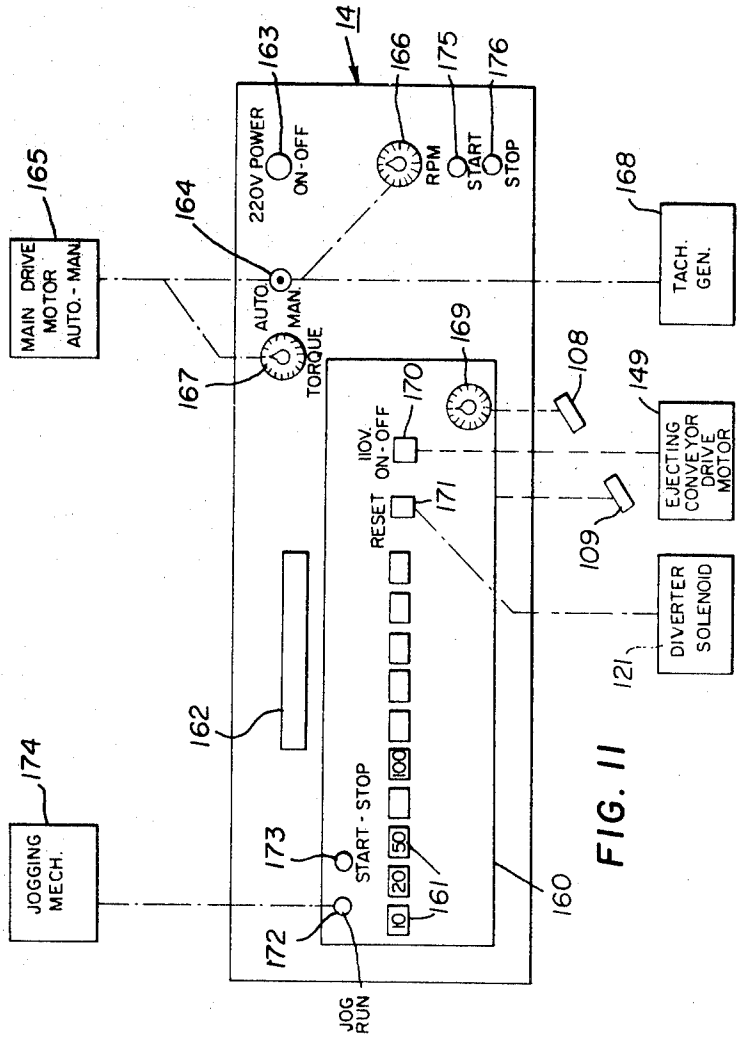
14
163
166
175
176
220V POWER
ON-OFF
RPM
START
STOP
165
MAIN DRIVE MOTOR AUTO. - MAN.
164
AUTO.
MAN.
TORQUE
167
168
TACH. GEN.
169
108
149
170
110V. ON-OFF
171
RESET
EJECTING CONVEYOR DRIVE MOTOR
109
DIVERTER SOLENOID
121
162
174
JOGGING MECH.
173
START - STOP
10
20
50
100
161
160
172
JOG RUN

FIG. 11

AUTOMATIC STACKING MACHINE

This invention relates to a machine for stacking newspapers or the like articles in a predetermined arrangement.

When stacking newspapers or the like articles having a folded edge, it is desireable to stack approximately half of these articles with their folded edge on one side of a bundle and the other half with their folded edge on the opposite side, to provide a substantially uniform bundle. If the articles were stacked with their folded edge all to one side the result would be an irregular bundle and the top articles would tend to slide off the stack. Further, such a bundle is undesirable for typing.

Of the prior art apparatus known for stacking newspapers or the like articles, the majority of these machines stack the articles with their folded edge all to one side. Other apparatus known for stacking articles in an arrangement for obtaining a substantially uniform bundle, are quite bulky, occupying large areas, and stack the articles some facing up and others facing down. This type of stacking may not be desireable if the articles were then diverted to a machine for labelling a selected side of the folded front page or for sorting by reading labels already affixed to a selected side. Also some articles have folds on two adjoining sides and this type of stacking would be undesirable as the articles are not inverted.

In other machines known, the stacking is effected by feeding the articles individually, in a separated manner, to a first stacking bucket until a predetermined number of articles is attained. The flow is then directed to a second bucket to allow for unloading of the first bucket and when the second stack is completed the cycle is reversed. Further, some of these machines handle incoming articles in a nonoverlapped manner whereas many articles are fed out from web presses or other machines in an overlapped arrangement which means that an intermediate apparatus would be required for separating the articles before being fed to the stacking machine.

It is an object of the present invention to provide a machine for, and a method of, stacking newspapers or the like articles which substantially overcomes any of the above mentioned disadvantages.

According to one broad aspect, the present invention relates to a machine for stacking newspapers and the like articles comprising a stacking bucket for receiving said articles, first and second conveying means each having an inlet and an outlet, said outlets each associated with a respective opposed side of said bucket, said first conveying means being driven at a conveying speed faster than said second conveying means to deliver said articles to said bucket in a predetermined manner and to provide for unloading of said bucket, and a diverter for diverting a predetermined number of articles to said inlet of said first and second conveying means.

According to a further broad aspect, the present invention relates to a method of stacking a predetermined quantity of newspapers and the like articles in bundles comprising the steps of:

i. counting said articles prior to stacking,

ii. diverting a predetermined quantity of articles to a first conveying means associated with one side of a stacking bucket for discharging said articles therein,

iii. diverting a predetermined quantity of articles to a second conveying means associated with the opposite side to said one side of said stacking bucket for discharging articles therein,

iv. driving said first and second conveying means at a different speed from each other to provide proper stacking of said articles, and

v. unloading said bucket when said predetermined amounts of articles are stacked without interrupting the incoming flow of articles to said bucket.

The invention is illustrated, by way of example, with reference to the accompanying drawings in which:

FIG. 1 is a perspective view of a stacking machine of the present invention,

FIG. 2 is a side view of some of the conveyors of the machine,

FIG. 3 is a top view illustrating the arrangement of the endless conveyor belts,

FIG. 4 is a side view of the stacking bucket and unloading conveyor,

FIG. 5 is a top view of FIG. 4,

FIG. 6 is a side view, partly sectioned of the receiving conveyor and associated mechanisms,

FIG. 7 is a top view of part of FIG. 6,

FIG. 8 is a front view of the diverter control mechanism,

FIG. 9 is a side view, partly fragmented, of FIG. 8,

FIG. 10 is a side view of the conveyor drives, and

FIG. 11 is a block diagram of the control panel and some associated mechanisms.

The working "newspapers and the like articles", as used in the present specification, will be understood to apply to such articles as newspapers, circulars, pamphlets, tabloids, envelopes, magazines, catalogs and other similar articles.

Referring to FIG. 1 of the drawings, there is shown, generally at 10, the stacking machine of the present invention. The incoming articles, not shown, are fed to a receiving conveyor section 12 and then a predetermined number of these articles are diverted and fed to both sides of a stacking bucket 13 by conveying mechanisms located in the machine housing 11. The machine may be operated either manually or automatically at a control panel 14.

Referring now to FIG. 2 there is shown the conveying mechanism, secured on a frame 9, for delivering newspapers and the like articles 15 to the stacking bucket 13. As shown, a plurality of overlapped or spaced articles 15 are approaching the conveying mechanisms on a receiving conveyor belt 16. A diverter mechanism, which will be described more fully later, is provided to cause a predetermined number of articles 15 to flow to an inlet 19 of a first conveying means 20 where an inverting mechanism 18 causes them to invert 180° about their axis of travel. The inverting mechanism 18 consists of two endless belts 21 and 22 the inner side of which is provided with a plurality of endless ridges, not shown, for securing the belts about their respective pulleys 23, 24, 25 and 26 which are provided with a plurality of grooves about their outer periphery. Endless belt 22 is trained between pulleys 23 and 24 and the belt is twisted 180° therebetween. Similarly, endless belt 21 is trained between pulleys 25 and 26 and also twisted 180°. The grooved pulleys 23 and 25 are the drive pulleys and secured one above the other in line with the center of the receiving conveyor 16 and adjacent its delivery end. Pulleys 24 and 26 are centered on the transporting conveyor portion 29 and aligned with pulleys 23 and 25 and positioned so as to cause the outer adjacent surfaces of endless belts 21 and 22, to be in frictional engagement along a path shown at 27 travelling in the direction of arrow 28. Thus, articles being fed between pulleys 23 and 25 are engaged between adjacent surfaces of belts 21 and 22 and follow path 27 where these are inverted 180° therealong. Since the belts 21 and 22 are substantially narrow belts in comparison with some articles being carried by them, guide rods (not shown) may be provided to support the overlapping sides of the articles along their travel through the inverting mechanism 18.

The transporting portion of the first conveying means 20 consists of two endless conveyors 30 and 31 arranged so that its respective surfaces are in frictional engagement along a predetermined path 32 to convey the articles therebetween. At the outlet or discharge end 33 or the first conveying means 20, there is provided two ejecting conveyors 34 and 35 driven at a constant speed and also having their respective surfaces in frictional engagement along a predetermined path 36.

The conveyor 31 consists of an endless belt 44 trained about pulleys 45 mounted on the same shaft as pulley 26 and 46 and drums 41 and 42 and in frictional engagement with pivotally fixed pulley 47 which provides adjustment of the tension in the endless belt 44 by displacing the pulley along axis 48. The conveyor 30 consists of an endless belt 43 trained about pulleys 37, mounted on the same shaft as pulley 24, and pulleys 38, 39 and 40 and in engagement with a portion of the periphery of the drums 41 and 42 directly opposite belt 44 so that belt 43

lie thereon along a predetermined path. To adjust the tension in endless belt 43, spring biased pulley 38 is pivotally secured and displaceable in the direction of axis 49. The endless ejecting conveyors 34 and 35 comprise an endless belt 50 trained between drive pulley 51 and pulley 52 (mounted on the same shaft as pulley 40) and endless belt 53 trained between spring biased pivot pulley 54 and pulley 55 mounted on the same shaft as pulley 46, respectively. All the pulleys of the machine are elliptically crowned to hold its associated belt thereover. All the pulleys are mounted at idle with the exception of those where it is disclosed that they are fixed.

As can be seen from FIG. 3 the conveyors 30 and 31 comprise a plurality of endless belts 43, each trained about their respective pulleys 40, 40*a* etc., 39, 39*a* etc. Similarly the ejecting conveyor 34 may comprise one or more endless belts 36 trained between pulleys 50 and 52 or 50*a* and 53*a* etc. Also the shafts on which opposed pulleys 51, 54 or 52, 55 are secured are offset to allow different thickness of material to be carried by the belts in the area between adjacent pulleys. The spring biased pulleys also provide self-adjusting tension when larger articles are conveyed between the belts.

Thus, the first conveying means 20 engages the articles 15 at the inlet 19, inverts and transports them between belts 21 and 22 and further transports them along path 32 to the ejecting conveyors 34 and 35 where these are ejected at a constant speed, which is slightly faster than the maximum speed of the conveyors 30 and 31, into the stacking bucket 13. The stacking bucket 13 (see FIGS. 4 and 5) is tilted on a compound angle of approximately 15° to cause the material to square up into one common corner of the bucket to provide a square and even bundle. If desired the bucket may be provided with a jogging mechanism (not shown) to vibrate the bucket. The bucket 13 is provided with a side plate 55 and a back plate 56 which may be made adjustable to accommodate various size of articles. A deflecting plate 57 (see FIG. 2) is adjustably secured to the frame of the machine 10 on the opposite side of the ejecting conveyor of the second conveying means to prevent any articles from being shot outside the bucket 13. The deflecting plate 57 further extends downwardly on the frame to close in the first conveying means. An opening, not shown, is provided in the deflecting plate in the area of the discharge end 33 to permit the articles from ejecting conveyor 34 to be delivered to the bucket 13.

After a predetermined number of articles has been discharged in the bucket via the first conveying means 20, the diverter 17, which is initially in position "A," is now moved to position "B" to direct the stream of articles to the inlet 66 of the second conveying means 65. The articles are then held between the belts of two conveyors 67 and 68 along a predetermined path and ejected at the outlet 69 into the stacking bucket 13 by means of ejecting conveyors 70 and 71. As can be readily seen from FIG. 2 the arrangement of conveyors 67, 68, 70 and 71 constituting the second conveying means 65, is the same as those forming part of the first conveying means 20 and for this reason will not be described.

Referring to FIGS. 4 and 5, there is shown the stacking bucket 13 and an associated unloading conveyor 80. The base of the bucket consists of an endless belt 81 trained about two idler rollers 82 and 84. In its loading position the bucket is tilted back on supporting bar 83 to a compound angle of approximately 15° by means of a linkage 73 and solenoid 72 (not shown in detail). In its tilted position the bucket defines a low corner 93 at the intersection of plates 55 and 56.

To unload, the bucket 13 is brought back to its horizontal position, as shown in FIG. 4, by means of its linkage and associated solenoid. At this position, the belt 81, in the area of the roller 82, is in frictional engagement with driven roller 85 of the unloading conveyor 80 which imparts a drive thereto to unload the stack. The unloading conveyor 80 consists of a plurality of endless belts 88 trained about a roller 86 and an associated pulley 87 for each belt 88. The pulleys 87 are secured to a shaft 89 which is continuously driven via drive pulley 90. The drive from roller 86 is transmitted to roller 85 by friction and in turn to the belt 81 in the area between roller 82 and 85. Roller 85 has a suitable surface to cause good frictional engagement with belt 81. Thus, when the bucket 13 is in the unloading position (horizontally), a drive is imparted to endless belt 81 by frictional engagement with roller 85, and the articles resting on the belt are unloaded in the direction of arrow 91 and engaged by conveyor belts 88 to be delivered to a delivery table 92 or tying machine, not shown, which may be conveniently located in this area. The manner in which the bucket 13 is unloaded is sufficiently fast that the operation of the machine is not altered during unloading. A switch 94 may be provided in the area of the receiving end of the unloading conveyor 80, to signal the solenoid 72 to tilt the bucket to its loading position, after the trailing edge of the bundle has cleared the switch.

FIGS. 6 to 9 illustrate the mechanism of the receiving conveyor section 12 which comprises a plurality of conveyor belts 16 trained on rollers 99, 100, 101, 102 and driven pulleys 103. The central axis of rollers 100 and 101 are secured on a common shaft supported by a frame 104 which is positioned between the guide walls 118. The height of the inlet of the conveyor or the rollers 99 and 100 may be adjusted from the floor line by means of a rod 105 secured at one end to the frame 104 and cooperating with an adjustable clamp member 106 engaging along its length to rigidly secure the frame 104 at a selected height.

The receiving conveyor having been adjusted to the desired height, for receiving articles from an output conveyor 107 of an associated device, the machine can now receive and count the newspapers as these are fed to the machine 10. As the articles are falling onto the conveyor 16, these are engaged by the wheels 113 and the trailing end of the articles are caused to interrupt a light beam between light source 108 and photocell 109 mounted in support member 110 which is adjustably secured between rollers 99 and 100. An adjustable curved deflector bar 111 is positioned close to the inlet of the conveyor 16 to ensure proper reception and engagement of the articles 15 by the wheels 113. The bar 111 is secured to a supporting member 112 and is adjustable along its horizontal axis. Wheels 113 are secured on each side of bar 111 and are adjustable along the longitudinal axis of the bar.

Immediately in front of the diverter 17 there is provided an adjustable gate mechanism 113 which consists of a vertically adjustable article engaging arm 114 secure to horizontally adjustable arm 115, the latter being held by a supporting member 116. Further, on each side of arm 115 there is adjustably secured wheels 117 to provide pressure on the articles and help the feed of the articles. To make up a bundle of articles, a predetermined number of these are fed firstly to the inlet 19, of the first conveying means 20, between rollers 23 and 25, where these are inverted and transported to the bucket as mentioned hereinabove. Before a run of articles to the bucket, the diverter is preset to assume position "A" as shown in FIG. 6. After a predetermined number of articles are counted by photocell 109, the diverter is actuated to assume its position "B" where a predetermined number of articles are fed to the inlet 66 of the second conveying means 65. When this second predetermined number is reached the diverter 17 is actuated again to assume its initial preset position "A." However, because the articles 15 are passing over the diverter 17, the leading edge of the first article reaching the engaging arm 114 of the gate 113 will be stopped thereagainst until the article which is underneath it has cleared the arm 114, and the stopped article and those overlapped thereon will resume its trajectory to the inverting mechanism inlet 19.

Referring to FIGS. 8 and 9, there is shown the actuating mechanism for the diverter 17, as comprising three equally spaced elements 17 secured to a shaft 120. The diverter 17 is operated to its positions "A" and "B" by means of solenoid 121 of which the armature 122 is connected to a vertical arm 123 pivotally engaging a horizontal arm 124 which is pivotally secured at one end 125 to the frame of the machine and pivotally engaging at its other end 126 with a floating vertical

arm 127. The free end of the floating vertical arm 127 is provided with a pin 128 disposed perpendicular thereto and extending in the direction as shown in FIG. 9 to selectively engage with a portion of a diverter actuating cam 129. The cam 129 is secured to the shaft 120 and aligned with a stop member 130, also secured to the shaft 120. With the cam 129 and stop member 130 in the position as shown in FIG. 8, the diverter 17 would be lying approximately half way between positions "A" and "B." Positions "A" and "B" may be varied by displacing the adjustable rubber bumpers 131 and 132 along their longitudinal axis. These bumpers provide a stop for rotation of shaft 120 by limiting the arcuate displacement of member 130 when the cam is actuated in a counterclockwise or clockwise direction. In the periphery of the cam 129 there is provided a cavity constituting two pin engaging slots 134 and 135 each positioned on a respective side of a ridge 136. To actuate the cam 129, the solenoid 121 is energized drawing in its armature 122 and pulling retaining arm 123 downward against the action of spring 133 which provides an upward force on arm 123 to keep arm 124 against stop nut 137 when the solenoid is not energized, as shown in FIG. 8. When the solenoid 121 is energized the floating vertical arm 127 is also brought down and the pin 128 is caused to drop into slot 134 (assuming the diverter to be initially in position B which is the normal end of run position) rotating the cam 129 counter clockwise until the stop member 130 abuts the bumper 131 which prevents the shaft 120 from further rotation where the diverter assumes its position "A." The solenoid is maintained energized throughout the delivery of articles via the first conveying means 20 until a predetermined number of articles has been counted when the solenoid 121 is deenergized and rapidly re-energized upon command from the control panel counter module. When the solenoid 121 is deenergized, the vertical arm 127 is retracted, due to the action of spring 133 on arm 123, and the pin 128 moves out of slot 134. When the solenoid 121 is again energized, the arm 127 moves straight down again and pin 128 is directed into slot 135 by the ridge 136 which was lying to the side of the vertical axis of arm 127 because of the prior counterclock rotation of cam 129. As the arm 127 is pulled downwards, the pin engages in the slot 135 and effects a clockwise rotation of the cam 129 until the stopping member 130 abuts the rubber bumper 132. The diverter is thus brought to its position "B" and the articles are conveyed to the second conveying means 65.

FIG. 10 shows the drive arrangement for the conveyors of the stacking machine. A variable drive motor 140 may be manually controlled or automatically controlled, in the latter case the motor being responsive to a tach generator (not shown) associated with the output conveyor of an associated feed device. The motor 140 is provided with a double sheave 155, one section of which drives the second conveying means 65, the receiving conveyor 12 and the inverting mechanism 18, via timing belt 144. The other section of sheave 155 drives the first conveying means 20 and the unloading conveyor 20, via timing belt 146. Timing belt 144 transfers the drive to a sheave 158 secured to shaft 156. A timing belt 142 then transfers the drive from shaft 150 to the lower drum of the second conveying means to which there is associated a pulley 141 of appropriate diameter to cause the conveying speed of the second conveying means to be approximately half the speed of the first conveying means. A gear wheel 145 is also secured to shaft 156 and coacts with gear wheel 143 to drive the endless belt 16 of the receiving conveyor and belt 21 of the inverting mechanism. Belt 22 of the inverting mechanism is driven by shaft 156 to which its pulley 23 is secured. The other timing belt 146, connected to sheave 155 of motor 140, is trained about a double idle sheave 157. The drive of sheave 157 is transferred to a sheave 148 secured to the shaft of the lower drum of the first conveying means 20, via timing belt 147. The ratio between sheaves 157 and 148 is such as to drive the transporting conveyor portion of the first conveying means 20 slightly faster than the speed of the inverting mechanism and at least twice the speed of the second conveying means 65.

A constant drive motor 149, secured on the frame 9, provides the drive to the ejecting conveyors 34, 35, 70 and 71. The drive from motor 149 is directly coupled to a drive pulley 150 secured to the shaft supporting the wheels for ejecting conveyor 70. This drive is transmitted, via twisted belt 152, to drive pulley 151 of ejecting conveyor 34 of the first conveying means 20. It is necessary to twist belt 152 to get the drive of the ejecting conveyors in the direction of the bucket 13. The drive of ejecting conveyors 71 and 35 is provided by frictional engagement with conveyors 70 and 34, respectively, or through the articles in-between. The drive for the unloading conveyor 80 is provided by a belt connection from pulley 90 to a driven pulley 153 secured to the same shaft as pulleys 46 and 55 (see FIG. 2), via an intermediate pulley 154. Thus, the unloading conveyor 80 is operated at the same speed as the transporting conveyor portion of the first conveying means. All the drives described hereinabove are provided on a respective side of the machine not to interfere with the conveying mechanisms.

The operation of the machine will now be described with particular reference to FIG. 11 including also the other figures. FIG. 11 shows the control panel 14 and some of the controlled circuits illustrated in block diagram form. To connect power to the machine switch 163 is depressed to its "ON" position. Toggle switch 164 is then placed to the desired position for automatic "AUT." or manual "MAN." operation. In the manual position, the r.p.m. and torque of the drive motor 140 may be adjusted manually be means of variable potentiometers 166 and 167, respectively. In the automatic position of switch 164, these adjustments would be effected automatically, the drive motor 140 obtaining its control from a tach generator 168 coupled to the output conveyor 107 (FIG. 6) of an associated feed device.

A light control potentiometer 169 is provided, on a counter module 160, to adjust the intensity of light source 168. By depressing button switch 170, the necessary power is fed to the ejecting conveyor drive motor 149, to drive the ejecting conveyors at a constant speed slightly higher than the maximum speed attainable by the other feeding belt conveyors. By depressing the reset switch 171, the diverter solenoid 121 is energized to place the diverter 17 in its position "A" as shown in FIG. 8. Thus, the articles will be firstly fed to the inverting mechanism 18 of the first conveying means 20. A jog-run switch 172 and a start-stop jog switch 173 is provided on the control panel for starting a jogging mechanism 174 if such is provided with the bucket 13.

A plurality of button switches 161 programs the machine for the number of articles to be stacked in each bundle. For a stack of 20 articles the switch button marked "10" is depressed whereby the machine will stack a bundle of twenty articles, ten one way and ten in the opposite direction. The total count of "20" will then be automatically carried to a counter indicator 162 upon a signal to this effect from the photocell 109, where the incoming articles are detected. The machine is prepared for its initial run and the operation may be started by depressing "START" switch 175. At the end of the run the machine is stopped by switch 176 and the power disconnected by again depressing switch 163.

Assuming the diverter 17 is reset to position "A" and the articles on the receiving conveyor belt 16 are lined up to the diverter 17, toggle switch 164 placed on automatic and the switch button 161 marked "10" depressed, the stacking machine is ready for automatic continuous stacking of bundles of twenty articles upon depressing switch 175. Referring more specifically to FIG. 2, it can be seen that the first ten articles 15 will be directed to the inverting mechanism 18 of the first conveying means 20 for ejection in the stacking bucket 13. WHen the photocell reaches the count of ten (ten articles having been fed to the receiving conveyor 16), a signal is initiated by the counter module 160 causing the diverter solenoid 121 to reactuate the cam 129 and the diverter to assume position "B" where the articles are now directed to the second conveying means 65 to be fed to the bucket 13 in an inverted manner

to those articles delivered by the first conveying means **20**. Since the length of the conveying path of the first conveying means **20** is longer than the path of the second conveying means **65**, although less than twice the length, it is necessary to have the articles along the path of the first conveying means travelling at least twice the speed as those of the second conveying means to ensure that the last article from the first conveying means is ejected in the bucket **13** before the first article of the second conveying means **65** is ejected in the bucket **13**. After the photocell **109** has counted another ten articles fed to the receiving conveyor **16** a signal is again initiated to operate diverter **17** back to position "A." With reference to FIG. **6** it will be seen that as the diverter **17** is operated to its position "A," the articles travelling on the diverter will be pushed against gate **114** which is adjusted to engage the leading edge of the first article arriving thereat, thus permitting the last article (the twentieth of the stack) to continue its travel along the second conveying means. When this last article clears the area of gate **114**, the advancing articles being stopped by the gate **114** will fall by gravity (since the last article of the previous bundle is no longer thereunder) to continue its path to the inverting mechanism **18** of the first conveying means **20**. The length and speed of the first conveying means **20** is selected so as to provide enough time for the last article of the second conveying means to reach the bucket, thereby completing the stack, and for unloading of the bucket. The unloading operation for the bucket is initiated by detecting means positioned along the path of the first conveying means which will signal the bucket to unload when the first article for the second stack reaches a predetermined position which will allow ample unloading time. To unload the bucket **13** a solenoid **72** is energized and by means of linkage **73** causes bucket **13** to assume its horizontal unloading position (see FIG. **4**) where the endless belt **81** of the bucket **13** is driven to feed the articles to unloading conveyor **80** which in turn feeds them to a delivery table or tying machine or other equipment associated therewith. A switch **94** is provided at the receiving end of the unloading conveyor to initiate the loading cycle, causing the bucket to tilt to assume its loading position, after the trailing edge of the bundle has cleared the area of the switch **94**.

I claim:

1. A machine for stacking newspapers and the like articles comprising a stacking bucket for receiving said articles, first and second conveying means each having an inlet and an outlet, said outlets each associated with a respective opposed side of said bucket, said first conveying means being driven at a conveying speed faster than said second conveying means to deliver said articles to said bucket in a predetermined manner and to provide for unloading of said bucket, and a diverter for diverting predetermined number of articles to said inlet of said first and second conveying means.

2. A machine as claimed in claim **1** wherein said first and second conveying means each include a transporting conveyor portion and an ejecting conveyor portion.

3. A machine as claimed in claim **2** wherein said transporting conveyor portions each comprise two endless conveyor belts each defining a path whereby said belts are oppositely positioned along a portion of said path to frictionally engage said articles therebetween to transport them to said ejecting conveyor.

4. A machine as claimed in claim **2** wherein the transporting conveyor portion of said first conveying means further includes inverting means for inverting said articles.

5. A machine as claimed in claim **3** wherein the tension in each said two endless conveyor belts is selectively adjustable.

6. A machine as claimed in claim **2** wherein said transporting conveyor portion of said first conveyor means is driven at a conveying speed at least twice the conveying speed of said transporting conveyor portion of said second conveyor means.

7. A machine as claimed in claim **2** wherein said ejecting conveyor portion comprises two endless conveyor belts oppositely positioned to frictionally engage and transport said articles therebetween to eject them at said outlet into said stacking bucket, said ejecting conveyors being driven at a constant conveying speed independent of a slightly higher than the conveying speed of said transporting conveyor portion.

8. A machine as claimed in claim **7** wherein the tension in one of said two endless conveyor belts is self-adjustable to accommodate various thicknesses of articles conveyed therebetween.

9. A machine as claimed in claim **4** wherein said inverting means comprises two endless belts, each belt being held in tension between two pulleys and inverted 180°, each said pulleys being closely oppositely positioned and offset from their respective axis of rotation so that said belts are in contact with each other along a portion of its path to thereby transport said articles therebetween.

10. A machine as claimed in claim **9** wherein said two endless belts transport said articles from a receiving conveyor at the inlet of said first conveying means, said articles being inverted 180° about its axis of travel so that all of said articles in said bucket are stacked with the corresponding face on the same side of the stack.

11. A machine as claimed in claim **9** wherein the conveying speed of said two endless belts of said inverting means is at least twice the conveying speed of said transporting conveyor portion of said second conveying means.

12. A machine as claimed in claim **2** wherein said diverter comprises a diverter element positioned adjacent a receiving conveyor to divert the normal flow of articles to said first or second conveying means.

13. A machine as claimed in claim **12** wherein said diverter element is secured to a shaft at one end of which is fastened a cam which may be actuated to either a first or second position, said first position causing normal flow of said articles to said first conveying means, said second position causing said diverter element to interfere with the normal flow of articles and diverting it to said inlet of said second conveying means.

14. A machine as claimed in claim **13** wherein said cam is provided with a cavity in a portion of its outer periphery defining two pin engaging slots and a ridge therebetween to cause a pin associated with a solenoid linkage to engage therein upon actuation of an associated solenoid to displace said diverter element to said first or said second position, said first or second positions each being adjustable by means of two adjustable bumper members each cooperating with a respective side of the free end of a diverter positioning member secured at its other end to said diverter shaft.

15. A machine as claimed in claim **2** wherein there is further provided a receiving conveyor section for receiving and counting said articles as they are received by the machine.

16. A machine as claimed in claim **15** wherein said receiving conveyor section comprises an endless belt associated with a frame, said frame having adjustment means to adjust the height of its receiving end, a light and photocell assembly provided at said receiving end for counting each article, and a gate mechanism positioned along said endless belt and in close proximity to said diverter for delaying the conveyance of an article when said diverter is actuated to a predetermined position.

17. A machine as claimed in claim **2** wherein said stacking bucket comprises a base in the form of an endless belt trained about two idle rollers, said base being pivotally secured to a supporting bar on which said base is caused to tilt from a horizontal unloading position to a loading position to provide a low corner at the intersection of two article holding plates extending above said endless belt.

18. A machine as claimed in claim **17** wherein a jogging mechanism is connected to said stacking bucket for jogging same.

19. A machine as claimed in claim **17** wherein there is further provided an unloading conveyor having a driven roller secured to one end thereof, said driven roller being in frictional engagement with said endless belt of said bucket when said bucket is displaced to its horizontal position to thereby effect unloading of the stacked articles.

20. A method of stacking a predetermined quantity of newspapers and the like articles in bundles comprising the steps of:

i counting said articles prior to stacking,

ii diverting a predetermined quantity of articles to a first conveying means associated with one side of a stacking bucket for discharging said articles therein,

iii diverting a predetermined quantity of articles to a second conveying means associated with the opposite side to said one side of said stacking bucket for discharging articles therein,

iv driving said first and second conveying means at a different speed from each other to provide proper stacking of said articles, and

v unloading said bucket when said predetermined amounts of articles are stacked without interrupting the incoming flow of articles to said bucket.

21. A method as claimed in claim 20 wherein there is further provided the step of inverting said articles in said first conveying means prior to discharging in said stacking bucket.

22. A method as claimed in claim 20 wherein there is further provided the step of ejecting said articles from said first and second conveying means at a constant conveying speed faster than said conveying means.