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(54) **SIDE-MOUNTED COLLAPSIBLE TRAY**

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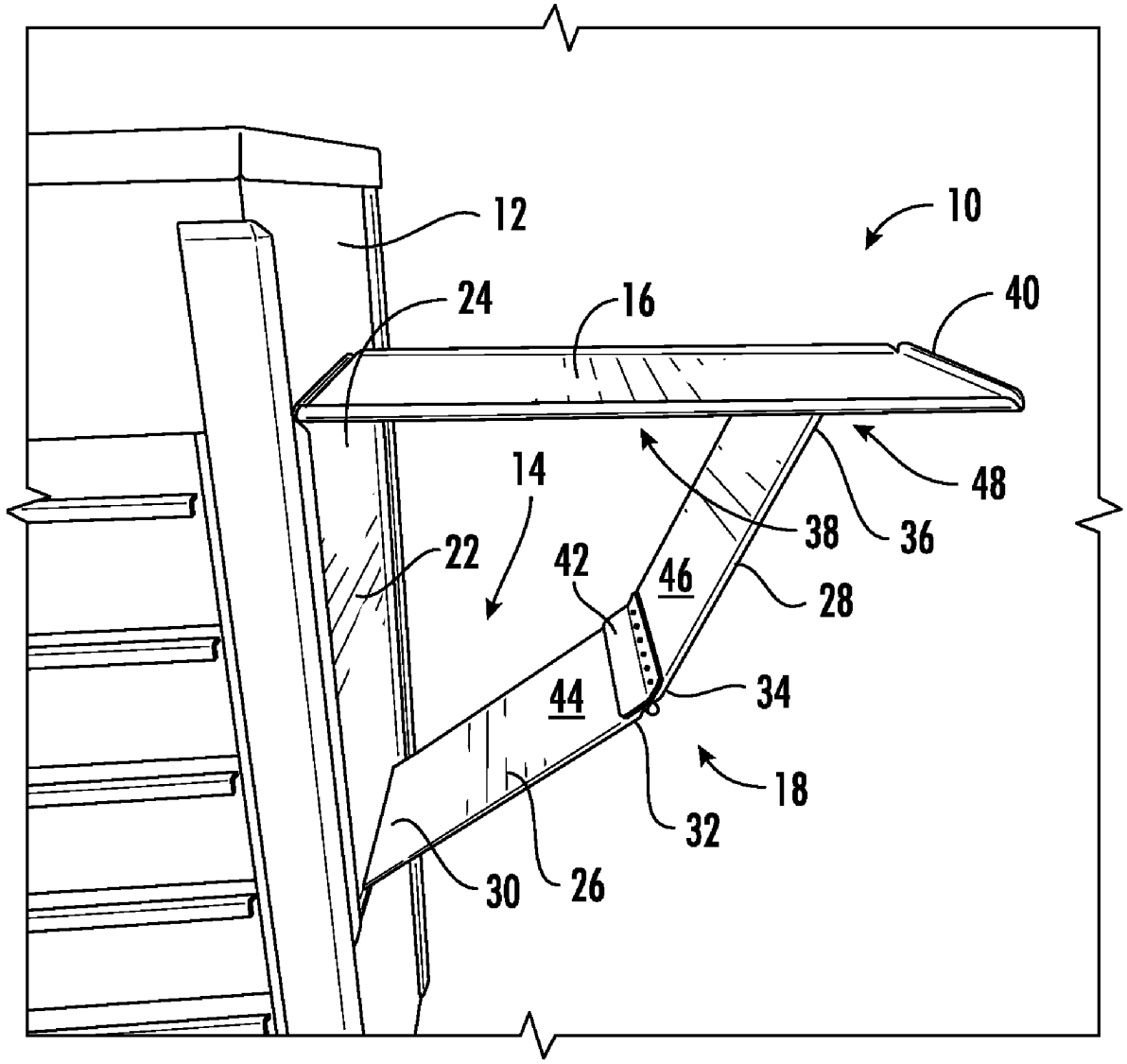
(57) **ABSTRACT**

A collapsible tray for mounting on an apparatus sidewall. The collapsible tray includes a first plate member and a second plate member hingedly attached to the first plate member. The collapsible tray also includes a tray hingedly attached to the second plate member and is hingedly supported by the apparatus sidewall. The tray is lockable in a first position where the tray is substantially perpendicular to the sidewall of the apparatus and collapsible to a second position where the tray hangs downward and substantially parallel the apparatus sidewall.



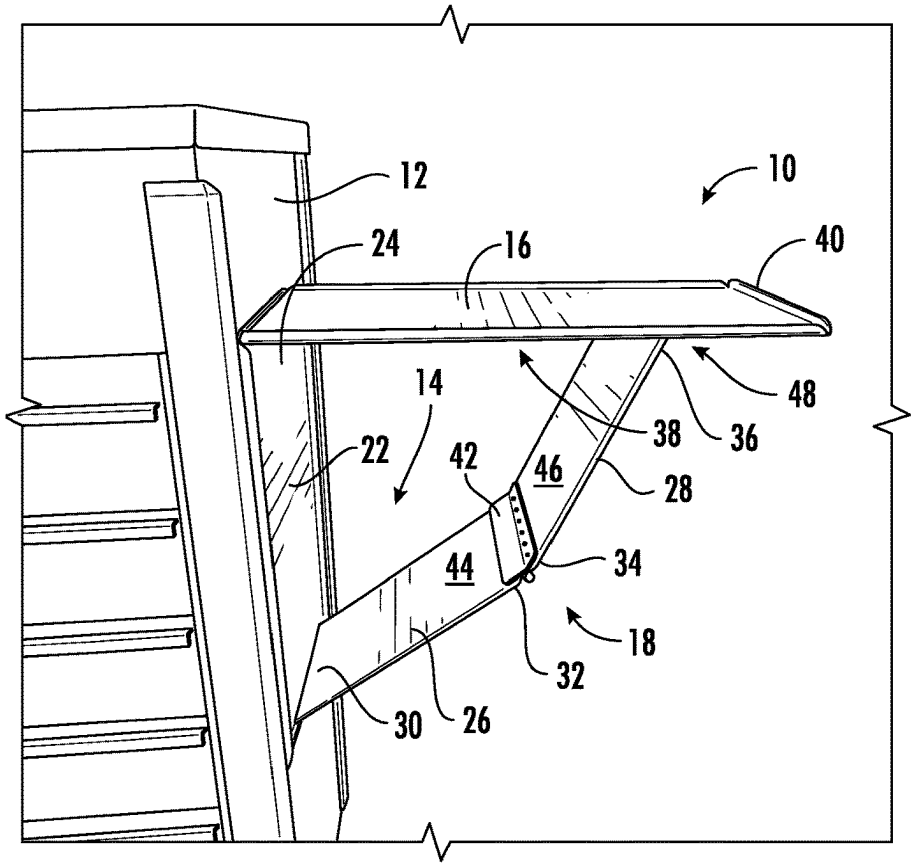


FIG. 1

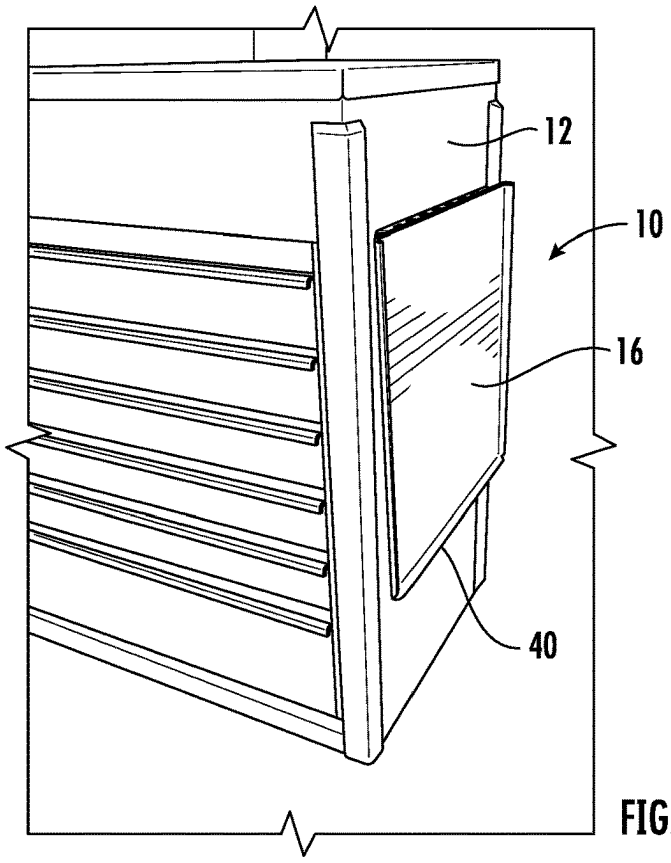


FIG. 2

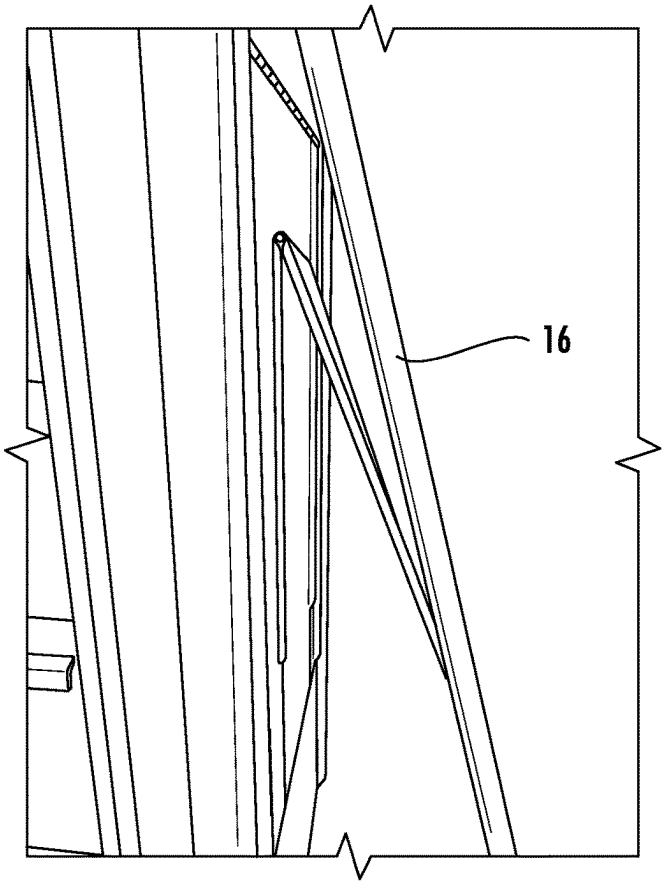


FIG. 3A

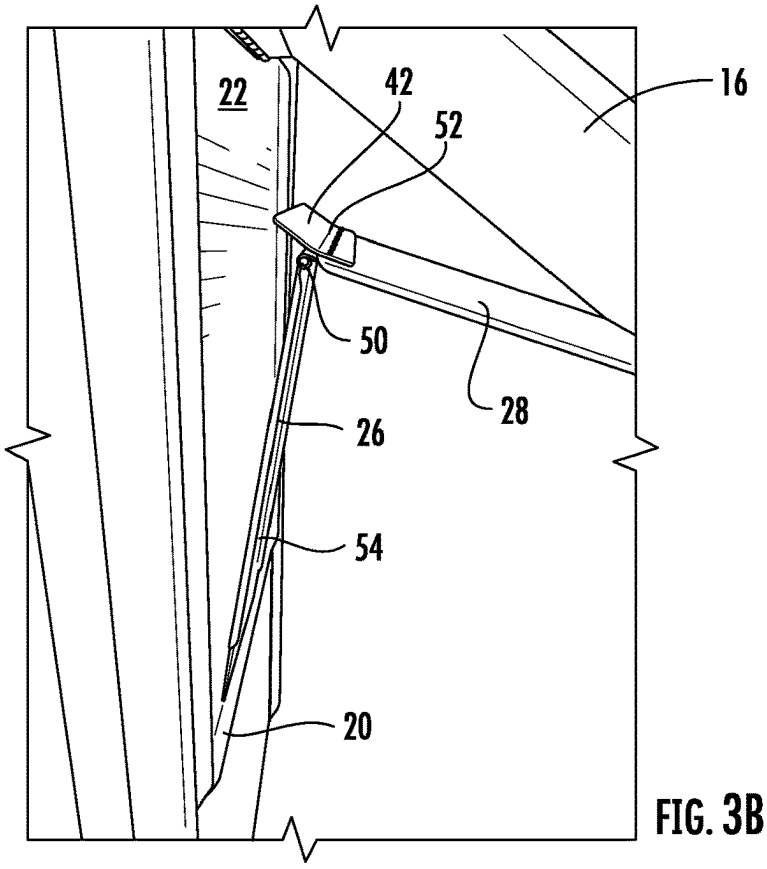


FIG. 3B

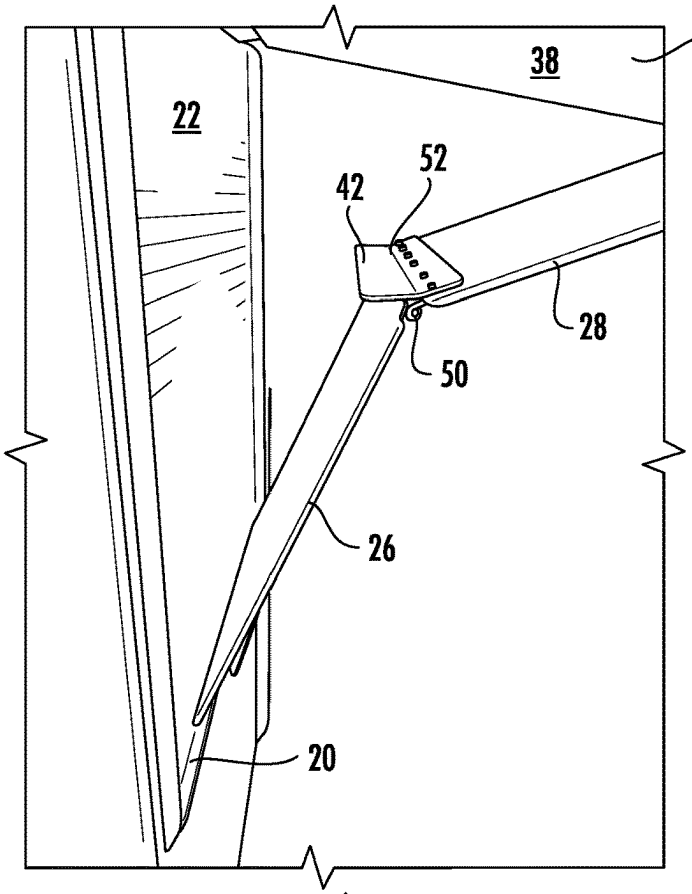


FIG. 3C

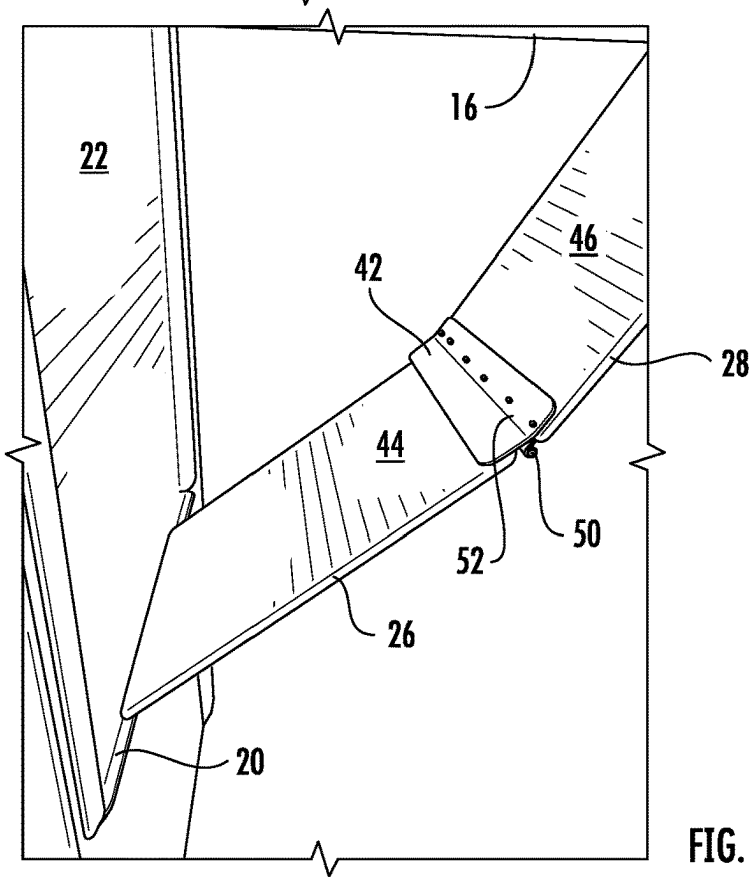


FIG. 3D

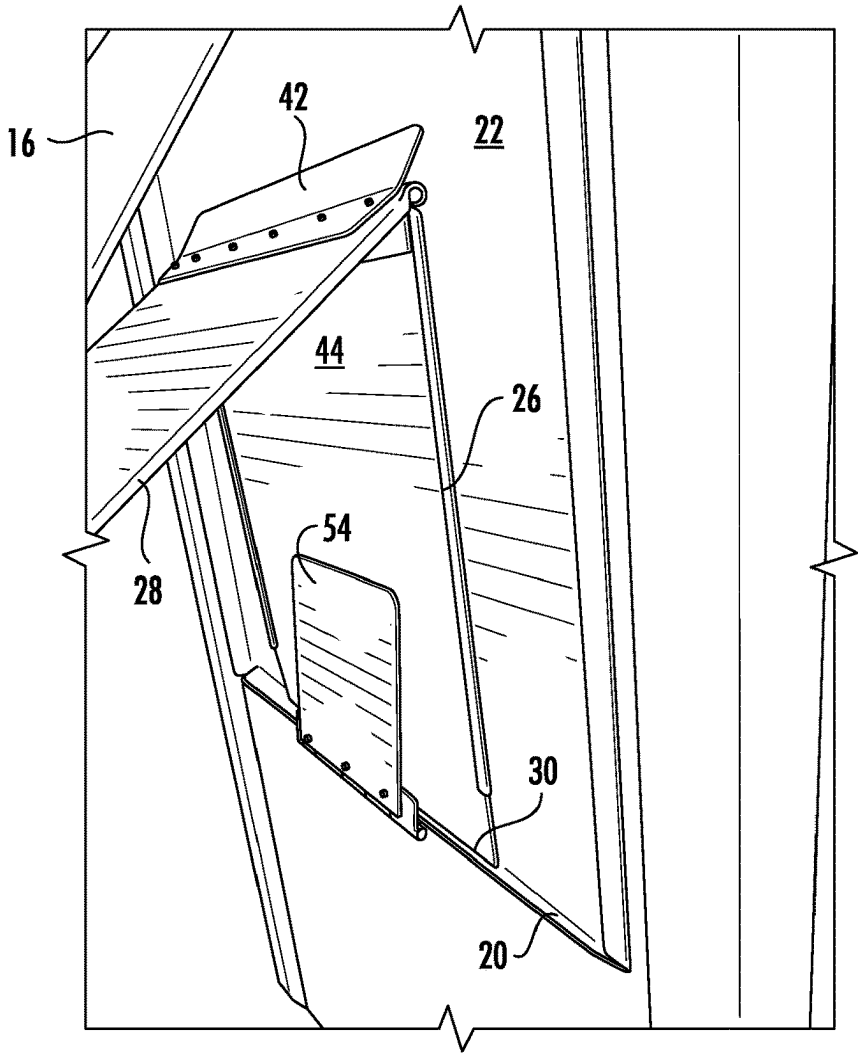


FIG. 4A

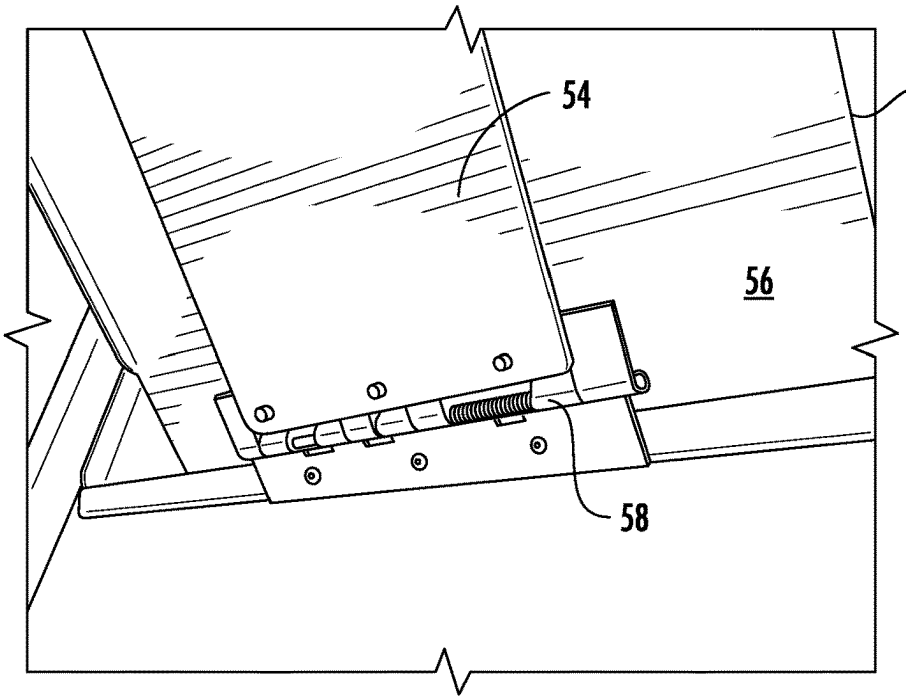


FIG. 4B

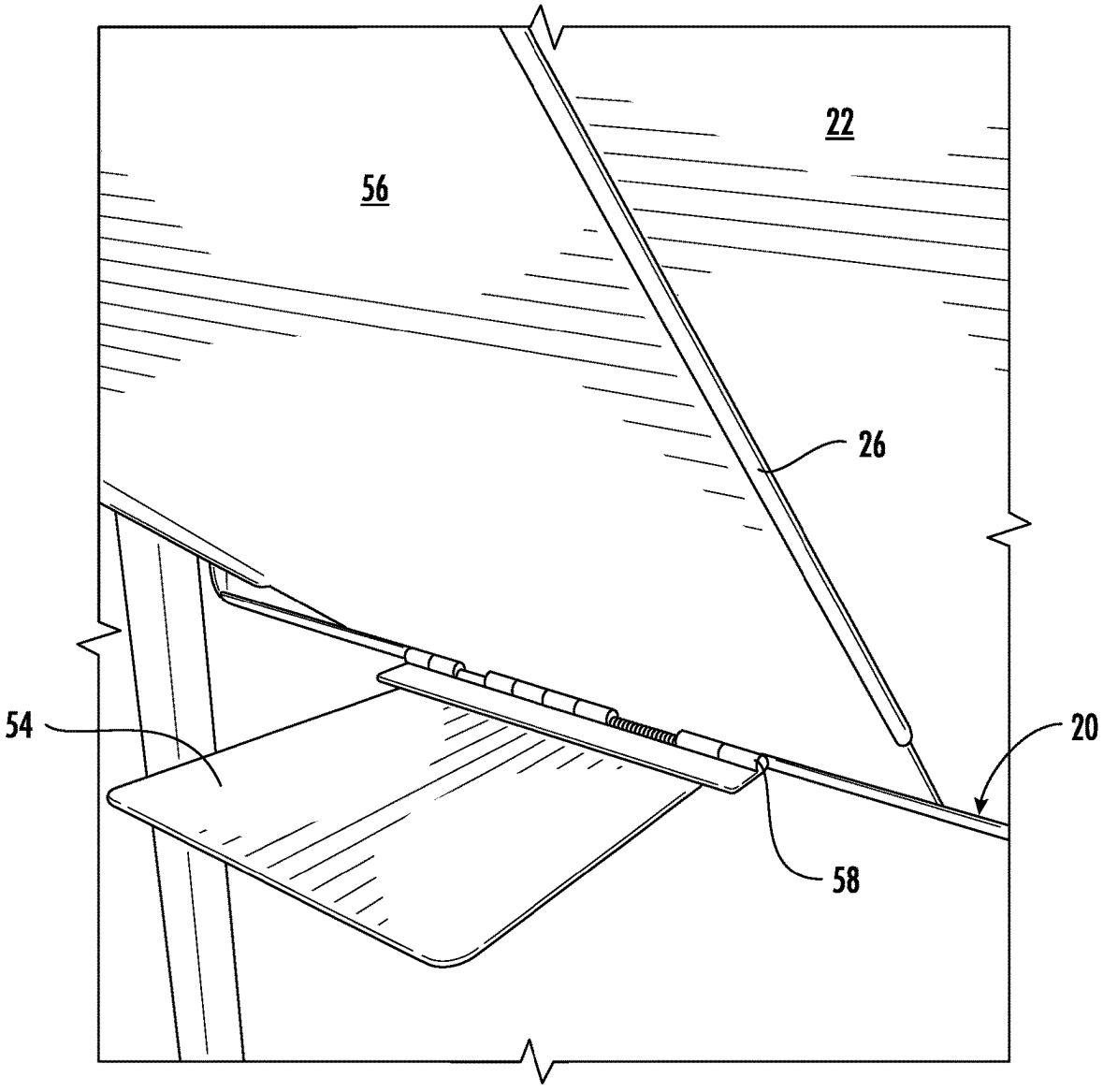


FIG. 4C

SIDE-MOUNTED COLLAPSIBLE TRAY

STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

[0001] Not applicable.

CROSS-REFERENCE TO RELATED APPLICATIONS

[0002] Not applicable.

BACKGROUND OF THE DISCLOSURE

1. Field of the Invention

[0003] The disclosure relates to a collapsible tray mountable to the side of an apparatus, such as a tool chest or a cabinet.

2. Brief Description of Related Art

[0004] Typical collapsible trays that can be mounted to the side of an existing apparatus are limited in the amount of weight they can handle. Furthermore, the typical collapsible tray has some sort of mechanism that must be physically manipulated to lock the tray in a usable position.

[0005] Accordingly, there is a need for a collapsible tray mountable to an apparatus that can support heavier loads and not require some type of mechanism that must be physically manipulated for the collapsible tray to stay in the usable position.

SUMMARY OF THE DISCLOSURE

[0006] The present disclosure is directed to a collapsible tray for mounting on an apparatus sidewall. The collapsible tray includes a first plate member and a second plate member hingedly attached to the first plate member. The collapsible tray also includes a tray hingedly attached to the second plate member and is hingedly supported by the apparatus sidewall. The tray is lockable in a first position where the tray is substantially perpendicular to the sidewall of the apparatus and collapsible to a second position where the tray hangs downward and substantially parallel the apparatus sidewall.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] FIG. **1** is a perspective view of a collapsible tray in an open position constructed in accordance with the disclosure.

[0008] FIG. **2** is a perspective view of the collapsible tray in a collapsed position constructed in accordance with the disclosure.

[0009] FIGS. **3**A-**3**D show perspective views of the collapsible tray moving between the open and collapsed positions constructed in accordance with the disclosure.

[0010] FIGS. **4**A-**4**C show perspective views of the collapsible tray from an underside angle constructed in accordance with the disclosure.

DETAILED DESCRIPTION OF THE DISCLOSURE

[0011] The present disclosure relates to a collapsible tray **10** that is mountable to an apparatus sidewall **12** wherein the apparatus can be a tool chest, cabinet or any other apparatus where it is desirable and possible for the collapsible tray **10** to be attached thereto. The collapsible tray **10** can include a mounting apparatus **14** for attachment of the collapsible tray **10** to the apparatus sidewall **12**, a tray **16** for supporting objects to be placed on the tray **16** and an actuation apparatus **18** that controls the operability of the collapsible tray **10**.

[0012] The mounting apparatus **14** can include any features necessary to provide the desired functionality to the collapsible tray **10**. In one embodiment, the mounting apparatus **14** includes a channel **20** attached to the mounting apparatus **14** for engaging the actuation apparatus **18**. The channel **20** can be attached to a mounting plate **22** in another embodiment. In this embodiment, the mounting plate **22** can be hingedly attached to the tray **16** on an upper end **24** of the mounting plate **22**. If no mounting plate **22** is incorporated into the mounting apparatus, **14** then the tray **16** can be hingedly attached to the apparatus sidewall **12**.

[0013] The actuation apparatus **18** can include a first plate member **26** and a second plate member **28** hingedly attached to the first plate member **26**. The first plate element **26** includes an engagement end **30** for insertion into the channel **20** of the mounting apparatus **14** during operation of the actuation apparatus **18** and a hinged end **32** for engagement with a hinged end **34** of the second plate element **28**. The second plate element **28** also includes a tray end **36** that is in hinged engagement with the tray **16**. In one embodiment, the first and second plate elements **26** and **28** can have sections removed such that the plate elements **26** and **28** are not completely solid. The first and second plate elements **26** and **28** can have any desired size and shape such that operation of the collapsible tray **10** occurs as designed.

[0014] The second plate element **28** can be hingedly attached to the tray **16** at any place on an underside part **38** of the tray **16** such that the operability of the collapsible tray **10** occurs as desired. The tray **16** can have an outer edge **40** that defines the part of the tray **16** farthest from the apparatus sidewall **12** when the collapsible tray **10** is in the usable position. The second plate element **28** can include a flange portion **42** that extends therefrom that engages an inner side **44** of the first plate element **26** to prevent the hinged relationship between the two plate elements **26** and **28** from rotating beyond a desired distance. The flange portion **42** can be secured to an inner side **46** of the second plate element **28** so that the flange portion **42** does not disrupt the hinged operation between the two plate elements **26** and **28** except for limiting the amount of rotation between the plate elements **26** and **28** as discussed herein.

[0015] In one embodiment, when it is desirable for the collapsible tray **10** to fold completely up against the apparatus sidewall **12**, the position of the hinged connection **48** between the tray end **36** of the second plate element **28** and the underside **38** of the tray **38** is dependent upon the distance the flange portion **42** extends from the hinged end **34** of the second plate element **28** and beyond the hinged connection **50** between the two plate elements **26** and **28**. The length of the flange portion **42** that extends beyond the second plate element **28** and the length of the second plate element **28** cannot be longer than the length of the tray **16** (distance from the apparatus sidewall **12** to the outer edge **40** of the tray **16**. Therefore, the hinged connection **48** cannot be further from the apparatus sidewall **12** than the length of the flange portion **42** that extends beyond the second plate element **28** and the length of the second plate element **28**.

The length of the second plate element **28** is the distance from the hinged connections of the second plate element **28**.

[0016] The flange portion **42** can be any size and shape such that it prevents rotation of the hinged operation of the hinged connection **50** at the desired position. In a further embodiment, the flange portion **42** can include a bend **52** therein. The bend **52** in the flange portion **42** is made at a desired angle to match the angle between the first and second plate elements **26** and **28** when the collapsible tray **10** is in the open and useable position. The bend **52** allows more of the flange portion **42** to engage with more of the inners sides **44** and **46** of the plate members **26** and **28**, respectively. When the collapsible tray **10** is in the open and usable position, the angle between the inner side **44** of the first plate element **26** and the inner side **46** of the second plate element **28** is greater than 90° and less than 180°. In another embodiment, the angle between the inner side **44** of the first plate element **26** and the inner side **46** of the second plate element **28** is greater than 135° and less than 180°.

[0017] The actuation apparatus **18** also includes a support plate **54** that can be hingedly attached to the apparatus sidewall **12** or the mounting apparatus **14** to provide support to the first plate member **26** when the collapsible tray **10** is in the open/usable position. The support plate **54** can have any size and shape such that the collapsible tray **10** can operated as described herein. In one embodiment, the support plate **54** is mounted such that it can freely rotate outward from the apparatus sidewall **12** to a certain point as the actuation apparatus **18** is manipulated to move the collapsible tray **10** from a collapsed position to the open/usable position. At the point where the support plate **54** can no longer rotate outward from the apparatus sidewall, a large part of the support plate **54** is engaged with the outer side **56** of the first plate member **26**. The support plate **54** engages the outer side **56** of the first plate member **26** to provide additional support to the actuation apparatus **18** when the collapsible tray **10** was in the open/usable position.

[0018] In another embodiment, the support plate **54** can be set under tension so that the support plate **54** is forced towards the apparatus sidewall **12** so that the support plate **54** can force the first plate member **26** towards the apparatus sidewall **12** when the collapsible tray **10** is in the collapsed position. The tension on the support plate **54** also causes the engagement end **26** of the first plate member **26** to stay in the channel **20** of the mounting apparatus **14** when the collapsible tray **10** is moved between the collapsed position and the open/usable position. The tension can be provided to the collapsible tray **10** via the hinged connection **58** between the support plate **54** and the apparatus sidewall **12** or the mounting apparatus **14**, or by some other means. It should be understood and appreciated that the tension can be applied to the support plate **54** in any manner known in the art.

[0019] The present disclosure is also directed to a method of supporting objects on the tray **16** of the collapsible tray **10**. The tray **16** can be raised and lowered by manipulating the actuation apparatus **18** to move the collapsible tray **10** between the collapsed position and the open/usable position. The collapsible tray **10** can be moved from the collapsed position to the open/usable position by grabbing the tray **16** and rotating it towards and beyond a horizontally disposed position. At some point, the tray **16** will be rotated far enough that the angle between the first and second tray elements **26** and **28** becomes less than 180°, which permits the actuation apparatus **18** to be able to support the tray **16** in a horizontal position without collapsing. When it is desirable to move the collapsible tray **10** from the open/usable position back to the collapsed position, the hinged connection **50** between the first and second plate members **26** and **28** has to be forced upwards and back towards the apparatus sidewall **12** (i.e., to where the angle between the plate members **26** and **28** is greater than 180°), which will allow the tray **16** to rotate back towards the apparatus sidewall **12**. The movement of the collapsible tray **10** to the collapsed position can be made easier by lifting up on the tray **16**.

[0020] The present disclosure is also directed to a method of mounting the collapsible tray **12** to the apparatus sidewall **12** and a method of making the collapsible tray **10**.

[0021] From the above description, it is clear that the present invention is well-adapted to carry out the objectives and to attain the advantages mentioned herein as well as those inherent in the invention. While presently preferred embodiments of the invention have been described for purposes of this disclosure, it will be understood that numerous changes may be made which will readily suggest themselves to those skilled in the art and which are accomplished within the spirit of the invention disclosed and claimed.

What is claimed is:

1. A collapsible tray for mounting on an apparatus sidewall, the collapsible tray comprising:

a first plate member;

a second plate member hingedly attached to the first plate member; and

a tray hingedly attached to the second plate member and is hingedly supported by the apparatus sidewall, the tray lockable in a first position where the tray is substantially perpendicular to the sidewall of the apparatus and collapsible to a second position where the tray hangs downward and substantially parallel the apparatus sidewall.

2. The collapsible tray of claim **1** further comprising a mounting apparatus that is securable to the apparatus sidewall.

3. The collapsible tray of claim **2** wherein the mounting apparatus includes a channel that an engagement end of the first plate member engages when the tray of the collapsible tray is in the first or second position.

4. The collapsible tray of claim **2** wherein the tray is hingedly attached to the mounting apparatus.

5. The collapsible tray of claim **1** further comprising a flange portion that extends from the second plate member to engage an inside part of the first plate member when the tray is in the first position to prevent rotation between the first and second plate members from rotating past a predetermined position.

6. The collapsible tray of claim **5** wherein the second plate element is hingely attached to an underside part of the tray at a hinged connection point.

7. The collapsible tray of claim **6** wherein the hinged connection point is closer to the apparatus sidewall than a combination of a length of the second plate member and a length of the flange portion.

8. The collapsible tray of claim **1** wherein an angle between an inner side of the first plate member and an inner side of the second plate member when the tray is in the first position is between 90 degrees and 180 degrees.

9. The collapsible tray of claim **8** wherein the angle between the inner side of the first plate member and the inner side of the second plate member when the tray is in the first position is between 135 degrees and 180 degrees.

10. The collapsible tray of claim **1** further comprising a support plate that is hingedly supported by the sidewall apparatus to engage the first plate member.

11. The collapsible tray of claim **3** further comprising a support plate that is hingedly supported by the sidewall apparatus to engage the first plate member.

12. The collapsible tray of claim **11** wherein the support plate engages an outer side of the first plate member.

13. The collapsible tray of claim **12** wherein the support plate is under rotational tension to force the support plate upwards and towards the apparatus sidewall to force the first plate member towards the apparatus sidewall when the tray is in the second position.

14. The collapsible tray of claim **13** wherein the support plate is hingedly attached to the apparatus sidewall.

15. The collapsible tray of claim **13** wherein the support plate is hingedly attached to the channel.

16. The collapsible tray of claim **5** wherein the flange portion has a bend portion therein to contribute to structural integrity of the collapsible tray when the tray is in the first position.

17. The collapsible tray of claim **16** wherein the bend portion of the flange portion is similar to an angle between inner sides of the first and second plate members.

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