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Multi-mold block drive device and injection molding machine having the multi-mold block drive device

Abstract

A multi-mold block drive device includes a guide seat and a plurality of speed reductions units. The guide seat includes opposite inner and outer peripheral surfaces, and a plurality of spaced-apart guide holes extending through the inner and outer peripheral surfaces. A plurality of drivers correspond respectively to the guide holes. Each speed reduction unit is connected between one of the guide holes and a corresponding driver, and includes a guide screw rod having an externally threaded portion, a guide sleeve having an internal thread facing the externally threaded portion, and a plurality of planetary screws interposed between the guide screw rod and the guide sleeve. Each planetary screw has a drive thread meshing with the externally threaded portion and the internal thread. An injection molding machine having the multi-mold block drive device is also disclosed.

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References Cited

U.S. PATENT DOCUMENTS

Patent No.	Issued Date	Patentee Name	U.S. Cl.	CPC
4685184	12/1986	Satkamp	384/275	F16C 13/006
4692039	12/1986	Teramachi	384/49	F16C 29/00
5186545	12/1992	Shirai	384/43	F16C 29/063
6029428	12/1999	Terminella	53/139.2	B29C 66/8412
9669573	12/2016	Kariya	N/A	B29C 45/50
11400641	12/2021	Neboian	N/A	B33Y 40/00

FOREIGN PATENT DOCUMENTS

Patent No.	Application Date	Country	CPC
202239570	12/2011	CN	N/A
204957680	12/2015	CN	N/A
116692482	12/2022	CN	N/A
3098052	12/2015	EP	B29C 45/0005
06-04426	12/1993	JP	N/A
M547433	12/2016	TW	N/A
I673446	12/2018	TW	N/A
WO-0074922	12/1999	WO	B29D 11/00413
WO-2014170932	12/2013	WO	B29B 7/248

OTHER PUBLICATIONS

Machine translation JPH0604426U (Year: 1994). cited by examiner

Machine translation CN202239570U (Year: 2012). cited by examiner

Machine translation WO2014170932A1 (Year: 2014). cited by examiner

Machine translation TWI673446B (Year: 2019). cited by examiner

Torque Transmission, What is a Speed Reducer? How does a Speed Reducer work?

<https://www.torquetrans.com/blog/how-a-speed-reducer-works> (Year: 2020). cited by examiner
Machine translation CN116692482A (Year: 2023). cited by examiner
Machine translation CN204957680U (Year: 2016). cited by examiner
Search Report appended to an Office Action, which was issued to Taiwanese counterpart application No. 111123095 by the TIPO on Jun. 29, 2023, with an English translation thereof; pp. 1-2. cited by applicant

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Background/Summary

CROSS-REFERENCE TO RELATED APPLICATION

(1) This application claims priority to Taiwanese Invention Patent Application No. 111123095, filed on Jun. 21, 2022.

FIELD

(2) The disclosure relates to a multi-mold block drive device for positioning a mold and an injection molding machine having the multi-mold block drive device.

BACKGROUND

(3) An existing multi-slider hybrid power mold guide device for a die casting machine, as disclosed in Chinese Patent Publication No. CN202239570U, includes a base support, a plurality of elbow linkage mechanisms, a plurality of molds, a plurality of pneumatic cylinders, and a plurality of hydraulic cylinders. Through movement of the shaft of each pneumatic cylinder in the direction of an axis thereof, each elbow linkage mechanism is driven by the shaft of the corresponding pneumatic cylinder to slidably move the corresponding mold relative to the base support to achieve the opening or closing of the mold. An additional locking force is applied by the corresponding oil cylinder to the mold after the mold is closed.

(4) Although the aforesaid multi-slider hybrid power guide mold device can achieve its intended purpose, there is room for improvement of the structure thereof.

SUMMARY

(5) Therefore, an object of the present disclosure is to provide a multi-mold block drive device that has a simple structure.

(6) According to this disclosure, the multi-mold block drive device suitable for driving a plurality of mold blocks includes a guide seat, a plurality of drivers and a plurality of speed reductions units. The guide seat includes an inner peripheral surface surrounding an axis and defining a mold hole, an outer peripheral surface opposite to the inner peripheral surface, and a plurality of spaced-apart guide holes surrounding the mold hole. Each guide hole extends through the inner and outer peripheral surfaces along a central line transverse to the axis, and communicates with the mold hole.

(7) The drivers are disposed spaced apart from the outer peripheral surface, are positioned relative to the guide seat, and correspond respectively to the guide holes. Each speed reduction unit is connected between one of the guide holes and a corresponding one of the drivers, and includes a guide screw rod that extends along the central line and that has a non-threaded portion connected to the corresponding driver and an externally threaded portion opposite to the non-threaded portion along the central line, a guide sleeve sleeved on the guide screw rod and having an internal thread

- facing the externally threaded portion, and a plurality of planetary screws parallel to the guide screw rod and interposed between the guide screw rod and the guide sleeve. Each planetary screw has a drive thread meshing with the externally threaded portion and the internal thread. The guide sleeve of each speed reduction unit is configured to be connected to a corresponding one of the mold blocks.
- (8) When the guide screw rod of each speed reduction unit is driven by the corresponding driver to rotate, the planetary screws are driven by the guide screw rod to rotate and move linearly along the externally threaded portion, and the guide sleeve is in turn driven by the planetary screws to move linearly therealong.
- (9) Another object of the present disclosure is to provide an injection molding machine that has the multi-mold block drive device and that can alleviate at least one of the drawbacks of the prior art.
- (10) According to another aspect of this disclosure, the injection molding machine includes a machine base, a feeding unit, a material feed backflow prevention device, a multi-mold block drive device, and a pair of molds. The feeding unit is mounted on the machine base for feeding a linear material, and includes a plurality of pull wheel assemblies spaced apart from each other along an axis, and a motor for driving the pull wheel assemblies. The material feed backflow prevention device is mounted on the machine base and is located on a side of the feeding unit for preventing backflow of the linear material during feeding. The multi-mold block drive device is mounted on the machine base and is located on a side of the material feed backflow prevention device.
- (11) The multi-mold block drive device is suitable for driving a plurality of mold blocks, and includes a guide seat, a plurality of drivers, and a plurality of speed reduction units. The guide seat includes an inner peripheral surface surrounding an axis and defining a mold hole, an outer peripheral surface opposite to the inner peripheral surface, a plurality of spaced-apart mold grooves formed in the inner peripheral surface and communicating with the mold hole, and a plurality of spaced-apart guide holes each of which extends through the outer peripheral surface along a central line transverse to the axis and communicates with a respective one of the mold grooves. The drivers are disposed spaced apart from the outer peripheral surface, are positioned relative to the guide seat, and correspond respectively to the guide holes.
- (12) Each speed reduction unit is connected between one of the guide holes and a corresponding one of the drivers, and includes a guide screw rod that extends along the central line and that has a non-threaded portion connected to the corresponding one of the drivers and an externally threaded portion opposite to the non-threaded portion along the central line, a guide sleeve sleeved on the guide screw rod and having an internal thread facing the externally threaded portion, and a plurality of planetary screw parallel to the guide sleeve and interposed between the guide screw rod and the guide sleeve. Each planetary screw has a drive thread meshing with the externally threaded portion and the internal thread. The guide sleeve of each speed reduction unit is configured to be connected to a corresponding one of the mold blocks.
- (13) When the guide screw rod is driven by the corresponding one of the drivers to rotate, the planetary screws are driven by the guide screw rod to rotate and move linearly along the externally threaded portion, and the guide sleeve is in turn driven by the planetary screws to move linearly therealong.
- (14) The pair of molds are disposed in two opposite ones of the mold grooves, are located at a material discharge end of the material feed backflow prevention device, and are capable of receiving a flowable raw material extruded from the material discharge end. The pair of molds are configured to be clamped and locked by the mold blocks when the mold blocks are driven by the multi-mold block drive device to move toward each other.

Description

BRIEF DESCRIPTION OF THE DRAWINGS

- (1) Other features and advantages of the disclosure will become apparent in the following detailed description of the embodiment with reference to the accompanying drawings. It is noted that various features may not be drawn to scale.
- (2) FIG. 1 is a perspective view of an injection molding machine according to an embodiment of the present disclosure.
- (3) FIG. 2 is a schematic plan view of the embodiment.
- (4) FIG. 3 is an enlarged exploded perspective view of a guide seat and an assembly of a linear bearing unit and a speed reduction unit of a multi-mold block drive device of the embodiment.
- (5) FIG. 4 is an exploded perspective view of the linear bearing unit and the speed reduction unit of the multi-mold block drive device of the embodiment.
- (6) FIG. 5 is an assembled sectional view of the linear bearing unit and the speed reduction unit of the multi-mold block drive device of the embodiment.
- (7) FIG. 6 is a sectional view taken along line VI-VI of FIG. 5.
- (8) FIG. 7 is a sectional view of the injection molding machine of this disclosure.

DETAILED DESCRIPTION

- (9) Referring to FIGS. 1 to 3 and 7, a multi-mold block drive device **100** according to an embodiment of the present disclosure is suitable for mounting on an injection molding machine **1** which is used for producing optical lenses, and is capable of driving a plurality of mold blocks **101** to lock a pair of molds **102**. The multi-mold block drive device **100** includes a guide seat **10**, a plurality of linear bearing units **20**, a plurality of drivers **30**, a plurality of positioning sleeves **40**, and a plurality of speed reduction units **50**. The injection molding machine **1** further includes a machine base **60**, a feeding unit **70**, and a material feed backflow prevention device **80**.
- (10) The guide seat **10** includes an inner peripheral surface **12**, an outer peripheral surface **13** opposite to the inner peripheral surface **12**, and a plurality of guide holes **14**. The inner peripheral surface **12** surrounds an axis (L) and defines a mold hole **11**. The inner peripheral surface **12** has a cross-section perpendicular to the axis (L) that is cross-shape, and has four mold grooves **121** that extend inwardly therefrom, that are spaced apart from each other by 90 degrees, and that surround and communicate with the mold hole **11**. In this embodiment, there are four guide holes **14** each radially extending through the outer peripheral surface **13** along a central line (L1) transverse to the axis (L) and communicating with a respective one of the mold grooves **121**.
- (11) Referring to FIGS. 4 and 5, in combination with FIGS. 1 to 3, each of the linear bearing units **20** is mounted in a respective one of the guide holes **14**, and includes a main body **21**, two sealing covers **22** disposed on two opposite ends of the main body **21** along the central line (L1), and a plurality of track roller units **23** disposed between the main body **21** and the sealing covers **22**. The main body **21** has a central hole **211** extending along the central line (L1), and a plurality of equiangularly spaced-apart through grooves **212** spaced apart from and surrounding the central hole **211** and parallel to the central line (L1). The central hole **211** is defined by a hole-defining wall. The hole-defining wall of the central hole **211** is formed with a plurality of inward grooves **213** respectively corresponding to the through grooves **212**. Each sealing cover **22** is a hollow short cylinder, and has an inner end surface **221** abutting against a respective one of the two opposite ends of the main body **21**, and a plurality of angularly spaced-apart bearing grooves **222** formed in the inner end surface **221** and respectively communicating with the through grooves **212** and the inward grooves **213**. Each of the track roller units **23** has one end, and the other end that passes through one of the through grooves **212**, that loops around a groove wall of a corresponding one of the bearing grooves **222** of one of the sealing covers **22**, that extends through a corresponding one of the inward grooves **213**, that loops around a groove wall of a corresponding one of the bearing grooves **222** of the other sealing cover **22**, and that is then connected to the one end thereof so as to form a closed loop.

(12) The drivers **30** are disposed spaced apart from the outer peripheral surface **13** of the guide seat **10**, are positioned relative to the guide seat **10**, and correspond respectively to the guide holes **14**. The drivers **30** of this embodiment are fixed on the machine base **60**, and each driver **30** employs a servo motor with a driving pulley set.

(13) Each positioning sleeve **40** is connected between the main body **21** of one of the linear bearing units **20** and a corresponding one of the drivers **30**. Each positioning sleeve **40** is hollow cylindrical in shape, and is spaced apart from and surrounds an outer portion of a respective one of the speed reduction units **50**.

(14) With reference to FIGS. **3** to **6**, each speed reduction unit **50** is connected between one of the linear bearing units **20** and a corresponding one of the drivers **30**, and includes a guide screw rod **51**, a guide sleeve **52**, and a plurality of planetary screws **53**.

(15) The guide screw rod **51** extends along the central line (L1), and has a non-threaded portion **512** with one end connected to the corresponding driver **30**, and an externally threaded portion **511** opposite to the non-threaded portion **512** along the central line (L1).

(16) The guide sleeve **52** is sleeved on the guide screw rod **51**, and includes an outer sleeve **521**, an inner sleeve **522** fixed inside the outer sleeve **521**, and an annular plate **523** fixed to one end of the outer sleeve **521**. The outer sleeve **521** has an inner surface **520** formed with a stepped inner bore **524** that extends along the central line (L1), an outer surface **525** opposite to the inner surface **520**, and an end flange **54** extending outwardly and radially from one end of the outer surface **525**. The stepped inner bore **524** has a large-diameter section **526** adjacent to the end flange **54**, and a small-diameter section **527** extending inwardly from the large-diameter section **526** away from the end flange **54** along the central line (L). The inner sleeve **522** is fixed in the large-diameter section **526**, and has an internal thread **528** facing the externally threaded portion **511**, and an annular end wall **5221** connected to an end periphery thereof that is distal to the end flange **54** and formed with a plurality of equiangularly spaced-apart inner pin holes **528'** surrounding the central line (L1). The externally threaded portion **511** of the guide screw rod **51** is threaded through the internal thread **528** of the inner sleeve **522** and is received in the small-diameter section **527**.

(17) The outer surface **525** of the outer sleeve **521** has a plurality of circumferentially spaced-apart guide planes **529** corresponding respectively to the track roller units **23** and parallel to the central line (L1). The track roller units **23** are interposed between the guide planes **529** and the main body **21** to reduce friction between the outer sleeve **521** and the main body **21**. The annular plate **523** is sleeved on the guide screw rod **51**, is located on the non-threaded portion **512** immediately adjacent to the externally threaded portion **511**, and is fixed to the end flange **54**. The annular plate **523** has a plurality of angularly spaced-apart outer pin holes **523'** respectively coaxial with the inner pin holes **528'**. The other end of the outer surface **525** of the outer sleeve **521** of the guide sleeve **52** of each speed reduction unit **50** that is opposite to the end flange **54** is connected to a corresponding one of the mold blocks **101**.

(18) The planetary screws **53** are parallel to the guide screw rod **51**, and are interposed between the guide screw rod **51** and the inner sleeve **522**. Specifically, the planetary screws **53** are angularly disposed around the guide screw rod **51**, and are threadedly engaged between the externally threaded portion **511** and the internal thread **528** of the inner sleeve **522**. Each of the planetary screws **53** has two opposite ends respectively received in one of the inner pin holes **528'** and a corresponding one of the outer pin holes **523'**, and a drive thread **531** between the two opposite ends thereof and meshing with the externally threaded portion **511** and the internal thread **528**.

(19) Referring to FIG. **7**, the feeding unit **70** of the injection molding machine **1** is disposed on the machine base **60**, and includes a plurality of pull wheel assemblies **71** spaced apart from each other along the axis (L), and a motor **72** for driving the pull wheel assemblies **71** to rotate. Each of the pull wheel assemblies **71** includes upper and lower pull wheels. The pull wheel assemblies **71** are used for pulling a solid linear material to move toward the material feed backflow prevention device **80**. The linear material may be a glass or plastic linear material.

(20) The material feed backflow prevention device **80** is disposed on a side of the feeding unit **70** to prevent backflow of the linear material during feeding. The material feed backflow prevention device **80** is not an important feature of this disclosure, so that the detailed structure and operating principle thereof will not be described herein.

(21) The pair of molds **102** of this embodiment are disposed in opposite upper and lower ones of the mold grooves **121**, and are located at a material discharge end of the material feed backflow prevention device **80** for receiving a flowable raw material extruded from the material feed backflow prevention device **80**.

(22) To further understand the effect produced, the technical means applied, and the expected effect of the coordination of the components of this disclosure, they will be described again below, and it is believed that a more in-depth and specific understanding of this disclosure can be obtained thereby.

(23) Referring to FIGS. **1**, **2**, **5** and **6**, to use the injection molding machine **1** for performing an injection molding operation, the drivers **30** are first activated, and the guide screw rod **51** of each speed reduction unit **50** is then driven by the corresponding driver **30** to rotate about its own axis. Rotation of the guide screw rod **51** will, in turn, drive the planetary screws **53** to rotate and move linearly along the externally threaded portion **511**. Through the meshing of the drive thread **531** of each planetary screw **53** with the externally threaded portion **511** and the internal thread **528**, rotation of the planetary screws **53** will drive and push the inner sleeve **522** of the guide sleeve **52** together with the outer sleeve **521** to move linearly therealong. As such, the guide sleeves **52** of the speed reduction units **50** can drive the mold blocks **101** to move toward each other to lock the molds **102** or away from each other to open the molds **102**.

(24) During locking or opening of the molds **102**, when the planetary screws **53** of each speed reduction unit **50** push the guide sleeve **52** thereof to move linearly along the center line (L1), the guide planes **529** on the outer surface **525** of the guide sleeve **52** are linearly guided by the track roller units **23** to keep accurate linear movement of the guide sleeve **52**. A friction force between the guide sleeve **52** and the mating component is low when the guide sleeve **52** moves linearly, so that noise can be reduced, and the service life of the guide sleeve **52** can be prolonged.

(25) After the mold blocks **101** are driven by the multi-mold block drive device **100** to clamp and lock the molds **102**, the solid linear material can be pulled and moved toward the material feed backflow prevention device **80** through the feeding unit **70**, and is transformed into a flowable raw material through the material feed backflow prevention device **80**. Finally, the flowable raw material is extruded out of the material feed backflow prevention device **80** into the molds **102** to complete the injection molding of optical lenses.

(26) In summary, each of the multi-mold block drive device **100** and the injection molding machine **1** of the present disclosure has a simple overall structure, is easy to manufacture and assemble, and has a good locking effect for the molds **102**. Therefore, the object of this disclosure can indeed be achieved.

(27) While the disclosure has been described in connection with what is considered the exemplary embodiment, it is understood that this disclosure is not limited to the disclosed embodiment but is intended to cover various arrangements included within the spirit and scope of the broadest interpretation so as to encompass all such modifications and equivalent arrangements.

Claims

1. A multi-mold block drive device suitable for driving a plurality of mold blocks, comprising: a guide seat including an inner peripheral surface surrounding an axis and defining a mold hole, an outer peripheral surface opposite to said inner peripheral surface, and a plurality of spaced-apart guide holes surrounding said mold hole, each of said guide holes extending through said inner peripheral surface and said outer peripheral surface along a central line transverse to the axis and

communicating with said mold hole; a plurality of drivers that are disposed spaced apart from said outer peripheral surface, that are positioned relative to said guide seat, and that correspond respectively to said guide holes; a plurality of speed reduction units each connected between one of said guide holes and a corresponding one of said drivers, each of said speed reduction units including a guide screw rod that extends along the central line and that has a non-threaded portion connected to the corresponding one of said drivers and an externally threaded portion opposite to said non-threaded portion along the central line, a guide sleeve sleeved on said guide screw rod and having an internal thread facing said externally threaded portion, and a plurality of planetary screws parallel to said guide screw rod and interposed between said guide screw rod and said guide sleeve, each of said planetary screws having a drive thread meshing with said externally threaded portion and said internal thread, said guide sleeve of each of said speed reduction units being configured to be connected to a corresponding one of the mold blocks; and a plurality of linear bearing units, each of said linear bearing units being disposed between one of said guide holes and a corresponding one of said speed reduction units, and including a main body, two sealing covers disposed on two opposite ends of said main body along the central line, and a plurality of track roller units disposed between said main body and said sealing covers, said guide sleeve further having an outer surface that is opposite to said internal thread and that has a plurality of circumferentially spaced-apart guide planes corresponding respectively to said track roller units and parallel to the central line; wherein, when said guide screw rod of each of said speed reduction units is driven by the corresponding one of said drivers to rotate, said planetary screws are driven by said guide screw rod to rotate and move linearly along said externally threaded portion, and said guide sleeve is in turn driven by said planetary screws to move linearly therealong.

2. The multi-mold block drive device as claimed in claim 1, wherein said main body of each of said linear bearing units has a central hole extending along the central line, and a plurality of equiangularly spaced-apart through grooves spaced apart from and surrounding said central hole and parallel to the central line, said central hole being defined by a hole-defining wall, said hole-defining wall of said central hole being formed with a plurality of inward grooves respectively corresponding to said through grooves, each of said sealing covers having an inner end surface abutting against a respective one of said two opposite ends of said main body, and a plurality of angularly spaced-apart bearing grooves formed in said inner end surface and communicating with said through grooves and said inward grooves, each of said track roller units having one end, and the other end that passes through one of said through grooves, that loops around a groove wall of a corresponding one of said bearing grooves of one of said sealing covers, that extends through a corresponding one of said inward grooves, that loops around a groove wall of a corresponding one of said bearing grooves of the other one of said sealing covers, and that is then connected to said one end of a corresponding one of said track roller units so as to form a closed loop.

3. The multi-mold block drive device as claimed in claim 2, further comprising a plurality of positioning sleeves each connected between said main body of one of said linear bearing units and a corresponding one of said drivers, each of said positioning sleeves being hollow cylindrical in shape and being spaced apart from and surrounding an outer portion of a respective one of said speed reduction units.

4. The multi-mold block drive device as claimed in claim 1, wherein said guide sleeve of each of said speed reduction units includes an outer sleeve having said outer surface, and an inner sleeve fixed inside said outer sleeve and having said internal thread, said outer sleeve further having an inner surface formed with a stepped inner bore that extends along the central line, said stepped inner bore having a large-diameter section, and a small-diameter section extending inwardly from said large-diameter section along the central line, said inner sleeve being fixed in said large-diameter section, said externally threaded portion of said guide screw rod being threaded through said internal thread of said inner sleeve and being received in said small-diameter section.

5. The multi-mold block drive device as claimed in claim 4, wherein said guide sleeve of each of

said speed reduction units further includes an annular plate fixed to one end of said outer sleeve and adjacent to said large-diameter section, said annular plate having a plurality of angularly spaced-apart outer pin holes, said inner sleeve further having an annular end wall connected to an end periphery thereof and formed with a plurality of equiangularly spaced-apart inner pin holes surrounding the central line and coaxial with said outer pin holes, each of said planetary screws having two opposite ends respectively received in one of said inner pin holes and a corresponding one of said outer pin holes, said drive thread of each of said planetary screws being located between said two opposite ends of a corresponding one of said planetary screws.

6. An injection molding machine, comprising: a machine base; a feeding unit mounted on said machine base for feeding a linear material, and including a plurality of pull wheel assemblies spaced apart from each other along an axis, and a motor for driving said pull wheel assemblies; a material feed backflow prevention device mounted on said machine base and located on a side of said feeding unit for preventing backflow of the linear material during feeding; a multi-mold block drive device mounted on said machine base and located on a side of said material feed backflow prevention device, said multi-mold block drive device being suitable for driving a plurality of mold blocks, and including a guide seat including an inner peripheral surface surrounding an axis and defining a mold hole, an outer peripheral surface opposite to said inner peripheral surface, a plurality of spaced-apart mold grooves formed in said inner peripheral surface and communicating with said mold hole, and a plurality of spaced-apart guide holes each of which extends through said outer peripheral surface along a central line transverse to the axis and communicates with a respective one of said mold grooves, a plurality of drivers that are disposed spaced apart from said outer peripheral surface, that are positioned relative to said guide seat, and that correspond respectively to said guide holes, and a plurality of speed reduction units each connected between one of said guide holes and a corresponding one of said drivers, each of said speed reduction units including a guide screw rod that extends along the central line and that has a non-threaded portion connected to the corresponding one of said drivers and an externally threaded portion opposite to said non-threaded portion along the central line, a guide sleeve sleeved on said guide screw rod and having an internal thread facing said externally threaded portion, and a plurality of planetary screws parallel to said guide screw rod and interposed between said guide screw rod and said guide sleeve, each of said planetary screws having a drive thread meshing with said externally threaded portion and said internal thread, said guide sleeve of each of said speed reduction units being configured to be connected to a corresponding one of the mold blocks, wherein, when said guide screw rod of each of said speed reduction units is driven by the corresponding one of said drivers to rotate, said planetary screws are driven by said guide screw rod to rotate and move linearly along said externally threaded portion, and said guide sleeve is in turn driven by said planetary screws to move linearly therealong; and a pair of molds that are disposed in two opposite ones of said mold grooves, that are located at a material discharge end of said material feed backflow prevention device, and that are capable of receiving a flowable raw material extruded from said material discharge end, said pair of molds being configured to be clamped and locked by the mold blocks when the mold blocks are driven by said multi-mold block drive device to move toward each other.
