Feb. 18, 1958 I. WOLF ET AL 2,823,503

BAG DISTENDING AND SUPPORTING DEVICE

Filed June 29, 1956 2 Sheets-Sheet 1

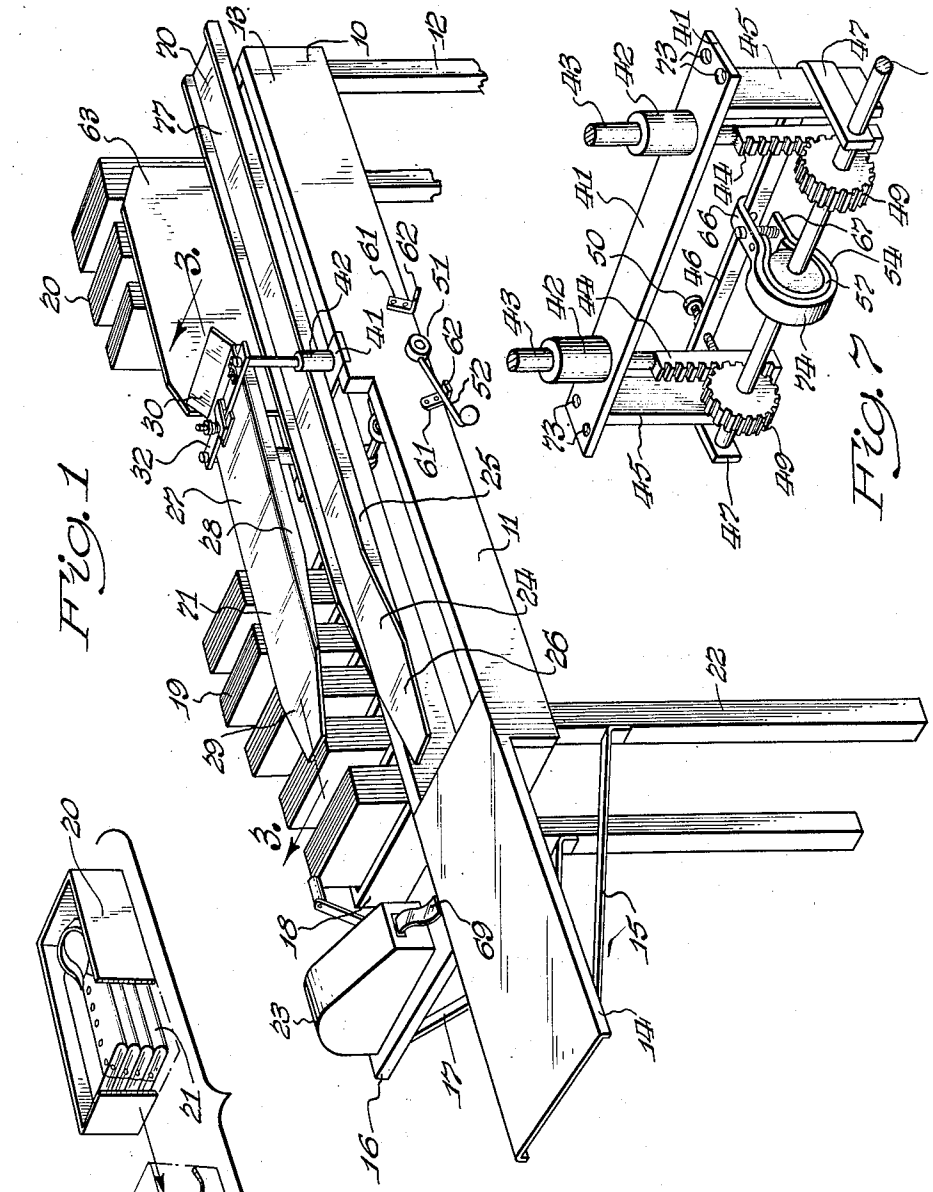


FIG. 1

FIG. 2

FIG. 3

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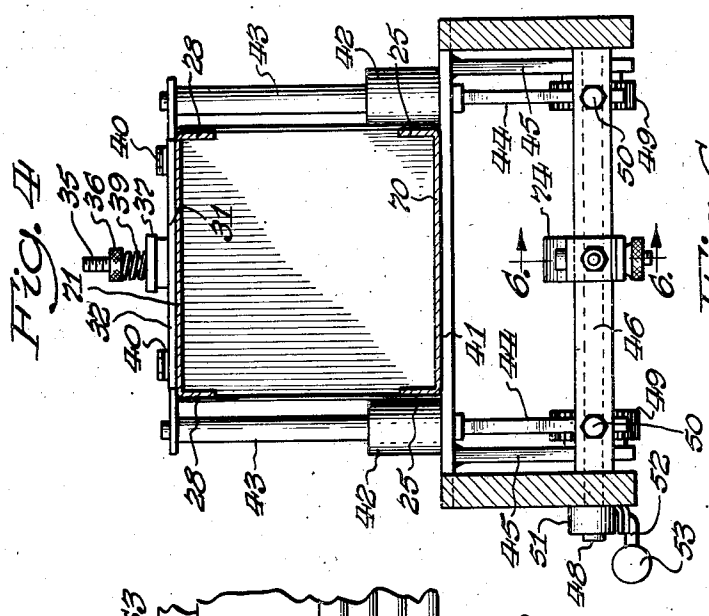


FIG. 4

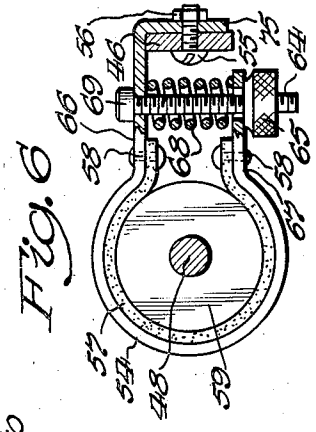


FIG. 6

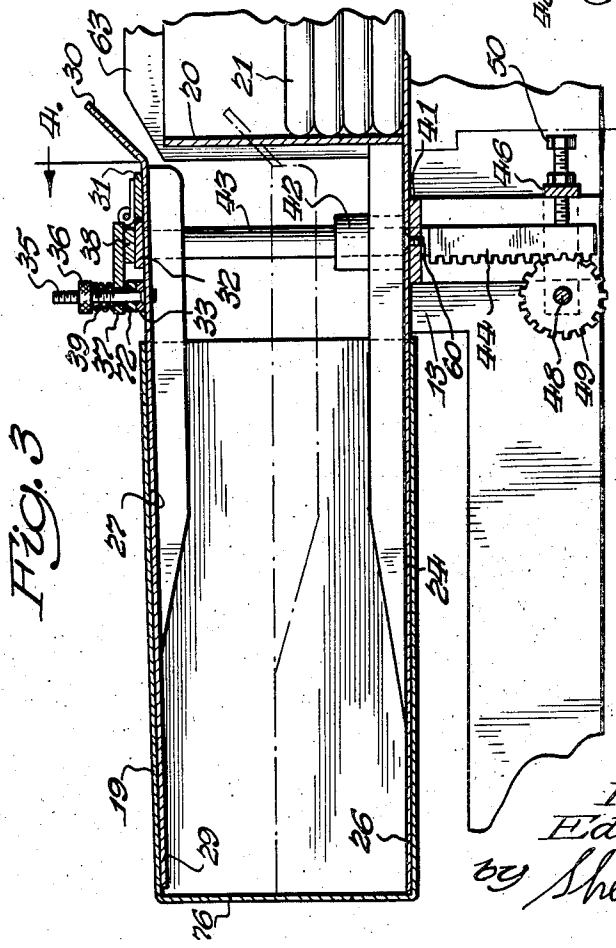


FIG. 3

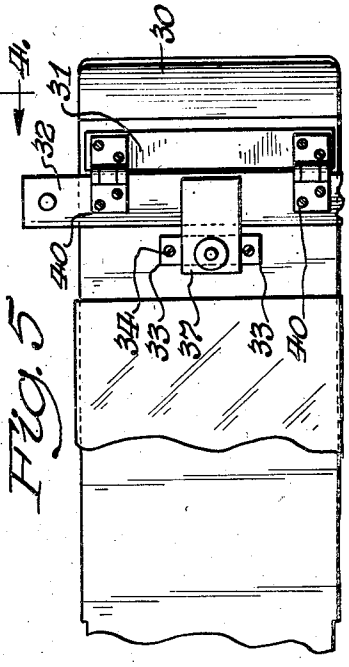


FIG. 5

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BAG DISTENDING AND SUPPORTING DEVICE

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15 Claims. (Cl. 53—187)

This invention relates to devices for distending bags. More particularly, it relates to a device for distending and supporting bags and the like to facilitate filling with articles be packaged thereby.

In the laundry and dry cleaning trade and industry and the like, the packaging of articles such as laundered shirts in cardboard boxes is no longer practiced extensively, a transition having occurred from the former procedure to packaging laundered or cleaned products in transparent or paper bags. Among the reasons for discontinuing the former practice are the cost of cardboard and the expense of assembling or setting up cardboard cartons or containers which are shipped to the laundry or dry cleaner in a "knock-down" form. Currently, many of the laundries and dry cleaners employ cardboard shells or frames which are first loaded or filled with laundered shirts or other garments and which are then filled into bags, and the like.

It is an object of the instant invention to provide a novel bag distending and supporting device which opens bags and supports the bags in open position during the loading or filling operation, thereby facilitating the bag-loading operation.

It is another object of the instant invention to provide a bag distending and supporting device having opposed chute-like gripper plates which separate to open and hold the bag to be loaded and which has a lip or guide to compress the materials being loaded into the limits of the bag opening.

It is a further object of this invention to provide a bag distending and supporting device having a plurality of chute-like gripper plates which open within the bag and which are provided with a spring tension mechanism whereby the bags will not be torn because of excessive separation of the bag-distending plates.

It is an additional object of the invention to provide a bag distending and supporting device having a fixed chute-like plate and a raisable chute-like plate which is gear operated and having brake means for holding the raisable plate in any selected raised position to support the bag during the loading thereof.

Other and further objects of the instant invention will become apparent from the following description and appended claims, reference being had to the accompanying drawings and the numerals of reference thereon.

On the drawings:

Fig. 1 is a perspective view of a device embodying one form of the invention.

Fig. 2 illustrates in perspective the object of the invention, namely, to distend bags and load the distended bag.

Fig. 3 is a longitudinal sectional view of the device taken substantially on the line 3—3 of Fig. 1 and looking in the direction of the arrows, a distended bag being held by the device.

Fig. 4 is a transverse sectional view taken substantially on the line 4—4 of Fig. 3 and looking in the direction of the arrows, the bag and shell supporting rack not being shown.

Fig. 5 is a fragment of a top-plan view of the device.

Fig. 6 is a view taken substantially on the line 6—6 of Fig. 4 and looking in the direction of the arrows.

Fig. 7 is a perspective view of the mechanism for operating and controlling the extension of the upper chute-like member.

Referring now more particularly to the drawings, the device illustrated comprises a frame, generally designated by the numeral **10**. As illustrated in Fig. 1, the frame includes a preferably rectangular base **11** which is supported on opposed sets of legs **12** and **22**. As illustrated in Figs. 1 and 3, one side of the base is shown as having a shoulder or elevation **13**. On the opposite side of the base extending outwardly therefrom there is provided a horizontal table extension **14** which is rigidly secured to the base. The extension **14** is supported by opposed braces **15** which are shown as being angularly disposed and which are secured to the legs **22** and the under side of the table extension **14** in any suitable fashion, as illustrated in Fig. 1. A horizontal support or shelf **16** is preferably secured to the table extension **14** and may be made integral therewith if desired, being further supported by the frame by means of brace or arm **17** which in Fig. 1 is illustrated as being connected at its upper end to the shelf **16**.

For convenience in utilizing the device, it is a good idea to have means for providing bags and shells within easy reach of the operator of the device. For this purpose, we provide an elongated tank, receptacle or rack **18** which is secured to the back of the device. The rack **18** is divided into a plurality of compartments or wells each of which is adapted to accommodate a plurality of collapsed bags **19** and a plurality of collapsed shells **20**. In practice, a range of sizes of bags **19** and shells **20** are provided; and the collapsed bags **19** are held in the left portion of the rack **18** and the collapsed shells **20** are held in the right portion of the rack **18**, as illustrated in Fig. 1.

The purpose or objective of the device is to successively distend bags **19** to the maximum of their extensibility and, while holding each such distended bag, permit the guiding of a stack of articles such as shirts **21** or the like into each such bag to complete the loading. It is or will become apparent, of course, that each device embodying our invention is adapted to accommodate and facilitate filling of a range of bag sizes. When the loading of each bag is completed, each loaded or filled bag is removed from the distending apparatus and may be sealed, for example, with tape **69** drawn from a suitable dispenser **23**, which is shown in Fig. 1 as being supported on the shelf **16**.

As illustrated in Figs. 1, 3 and 4, the device has an elongated longitudinally and horizontally extending lower guide, chute-like distending member or arm **24**. The chute-like member **24**, comprises an elongated longitudinally extending flat plate which has a tapered inner end portion **26** and longitudinally and vertically extending front and rear flanges **25** integral with the plate **70**. The lower chute-like member **24**, together with the upper chute-like distending member, guide or arm **27**, provides the actual bag distending and supporting elements or components and together when distended fully within a bag **19** provide a pair of grippers holding the bag from within. The chute-like member **27** is shorter than the chute-like member **24**; and said chute-like member **27** extends longitudinally and horizontally. The member **27** comprises a longitudinally extending horizontally disposed plate **71** which has a tapered end portion **29** and integral front and rear flanges **28** which extend longitudinally and are vertically disposed. The end portions **26** and **29** are in substantial alignment and are adapted to engage opposite sides of a bag end. The chute-like

member 27 has a transversely and upwardly sloping end lip or guide 30 opposite its tapered end portion 29, as illustrated in Figs. 1, 3 and 5, to compress the bag filling material 21 into the limits of the bag opening. The chute-like members or distending arms 24 and 27 are preferably of metal fabrication to provide smooth sliding surfaces.

As illustrated in Figs. 3, 4 and 5, a strap or spacer 31 is rigidly secured in transverse disposition on the top of the right end portion of the upper distending member 27. An elevator tie or transversely extending bar 32, having oppositely apertured end portions, extends across the top of the upper chute member 27 but is not secured thereto. Said tie 32 extends adjacent the strap 31 and is hingedly connected thereto by means of a pair of opposed hinges 40, the opposite plates of which are secured by suitable fasteners to the spacer 31 and the tie 32, as illustrated in Fig. 5.

As illustrated in Figs. 3 and 4, a bracket 33 is secured on the top of the upper distending member 27 by means of suitable fasteners such as screws or the like 34. Said bracket is spaced slightly from the tie 32 and rigidly secures the inner end of an upwardly extending threaded pin 35. The pin 35 extends upwardly through a small elastic or rubber cushion 72 which is mounted on top of the bracket 33 and through the apertured end of bearing plate or arm 37. The opposite end of arm or plate 37 is rigidly secured on a shoulder or a spacer 38 which is integral with or secured to the tie 32, as illustrated in Figs. 3 and 4.

A tension adjusting nut 36, having a knurled outer surface to permit manual adjustment thereof, is threaded on the upper end portion of the threaded pin 35. A compression-type spring 39 is mounted about the pin 35, the opposite ends of said spring bearing against the nut 36 and the arm 37.

A transversely extending strap or support 41, having its opposite end apertured, extends transversely across the shoulder 13 and is secured thereto, as illustrated in Figs. 1, 4 and 7, by means of fasteners such as screws or the like which extend through opposed apertures 73, illustrated in Fig. 7. The lower chute member 24 is rigidly secured to said strap 41 and is supported in rigid position by said strap and the shoulder 13 to the right of Fig. 1, as illustrated in Fig. 1.

Opposed vertical bearing members 42 are secured in apertures provided therefor in the strap 41 and are disposed inwardly of the frame 10, as clearly illustrated in Figs. 1, 4 and 7 of the drawings. A pair of opposed elevators, herein shown as comprising rods or shafts 43 are reciprocably mounted in bearings 42. At their upper ends said elevators 43 are secured in or to opposite end portions of the tie 32. The lower ends of the elevators 43 provide a reduced threaded nipple-like element 60 on each of which is mounted a depending gear rack or rack bar 34.

The upper ends of a pair of opposed hangers or depending arms 45 are rigidly secured by means of welding or the like to opposite end portions of the strap 41 as clearly illustrated in Figs. 4 and 7. A U-shaped bracket or band 46 is supported by said hangers in transversely extending position, as illustrated in Figs. 4 and 7. A pair of horizontally spaced adjusting screws 50 are threaded through said brackets 46 and the inner ends of said screws 50 bear against the rack bars 44, respectively, and adjust the tension of engagement of said rack bars 44 with respective gears 49 with which said rack bars mesh.

The gears 49 are secured in opposed and horizontally spaced positions on shaft 48. End portions of shaft 48 are journalled in the opposite arm-like extensions 47 of the brackets 46. One end of the shaft 48 extends through the base 11 and such shaft end has a collar 51 secured thereon. The inner end of a shaft actuating arm 52 is rigidly secured on said collar 51 and at its outer end said shaft actuating arm carries a ball grip 53, as illustrated in Fig. 1.

A brake, generally designated by the numeral 74, is mounted on a medial portion of the shaft 48 preferably in a position between gears 49. Said brake 74 comprises a bracket or curved shoe 54 having an end extension 75. The end extension 75 is rigidly secured to the bracket 46 by means of a suitable fastener herein shown as a screw 55 and nut 56, as illustrated in Fig. 6. The shoe 54 extends about the shaft 48 and has secured therein, by means of rivets 58 or the like, a brake or friction lining 57 which engages a brake drum, or apertured disc 59 about which said brake is mounted. Brake disc 59 is rigidly secured on the medial portion of the shaft 48.

The shoe 54 has a pair of outwardly extending opposed arms 66 and 67 which are apertured to accommodate the passage of a screw 64. The head 69 of screw 64 is enlarged and engages and is retained outwardly of arm 66 against which it bears. The screw is retained by a manually adjustable nut 65 the surface of which is knurled to permit manual adjustment thereof. Nut 65 bears against arm 67, as clearly illustrated in Fig. 6. A compression-type spring 68 is mounted about the shank of said screw 64 and bears against the inside surfaces of the arms 66 and 67, as illustrated in Figs. 6 and 7. By adjusting the position of the nut 65 on the screw 64, pressure may be varied on the cylinder 59, whereby the force required to move the shaft 48 is controlled.

A pair of brackets 61 are secured on the front face of the frame 10 in opposed positions by any suitable fasteners, as illustrated in Fig. 1. Each bracket 61 has an outwardly extending boss 62. The bosses 62 arrest motion of the control arm 52 in opposite extreme positions by engaging therewith.

The device operates in the following manner: At the commencement of the operation, the guide plate 71 is in the lower dotted line position illustrated in Fig. 3. The operator of the device, after having selected a bag 19 of appropriate size slips the same over the tapered guide ends 29 and 26 of the distending members 24 and 27 and draws the bag to the right with respect to Figs. 1 and 3 until the motion of the bag is arrested by engagement of the outer ends of the end portions 26 and 29 of the distending members with the bottom 76 of the bag 19, as illustrated in Fig. 3. Thereupon, the arm 52 is rotated counter-clockwise with respect to the embodiment shown to cause the gears 49 to drive rack bars 44 upwardly and accordingly to cause shafts 43 to move upwardly. This action causes the upper distending member 27 to move upwardly and open or distend the bag because the tie 32 carries bearing 37 upwardly and the bearing, in turn, forces upwardly against the spring 39. In turn, spring 39 pushes against nut 36 to pull the pin 35. Tension of spring 39 is so adjusted that member 27 is elevated parallel to the tie 32.

Ordinarily the operator knows through experience and by the "feel" of arm 52 when a bag has been distended to a maximum degree. In such extended position of the distending members 27, the bag is now tightly gripped and supported from within by both distending members. In the event that the operator should move the arm 52 too far counter-clockwise, tearing of the bag is avoided because the excessive pressure of the distending member 27 against the bag 27 will cause the distending member to tilt on hinges 40 against the action of the spring 39. When no counter force is encountered, the adjusted tension on the spring 39 will maintain all the leaves of the hinges 40 in a substantially horizontal plane.

When the bag 19 is fully distended, as illustrated in Figs. 2, 3 and 4, the operator will select an appropriate shell 20 of appropriate size and open it into a rectangular

configuration and seat it on the extension **77** of the plate **70**. Thereupon, the operator will load the shell **20** with articles such as shirts **21**. Because of the provision of the plate **70**, the shirts will slide easily along the guide **24**. In the event shells **20** are not desired to be used, the device is provided with a guide plate **63**, as illustrated in Figs. 1 and 3, against which the articles **21** may be properly stacked. For maximum economy, an operator ordinarily will select a bag size which is just large enough to accommodate the shell which is being used or the stack of shirts which will be filled into the bag. Frequently, the height of the stack will be larger than the bag opening through which the shirts must pass. Accordingly, lip **30** will compress the stack into the confined limits between members **24** and **27**, and the plate **71** will hold the stack compressed so that proper entry into the bag will be made without tearing of same. Flanges **25** and **28** operate to further guide the articles **21** in a proper path.

By adjusting the tension on the brake **59**, in the manner hereinbefore described, the arm **52** will remain in any selected position so that at all times, while a bag is mounted about the distending members **24** and **27** and is distended thereby, both hands of the operator may be employed without concern about the upper guide member falling. After the bag has been filled or loaded, it is manually withdrawn from the guides **24** and **27**, whereupon the guide **27** is lowered for the next operation by turning arm **52** clockwise into engagement with boss **62**.

As many changes or substitutions could be made in the above described construction and as many apparently widely different embodiments of the invention within the scope of the claims could be constructed without departing from the scope and spirit thereof, it is intended that all matter contained in the accompanying specification shall be interpreted as being illustrative and not in a limiting sense.

We claim:

1. A device for distending and supporting bags and the like, comprising a pair of opposed, horizontally disposed and parallel guide members to be disposed within a bag; means for extending one of said guide members parallel to the other thereof to fully distend the bag, whereby the bag is gripped and supported from within, and a guide member tilting mechanism bearing against one end portion of one of said guide members whereby the guide members when distended will not tear the bag.

2. A device for distending and supporting bags and the like, comprising a frame; a fixed guide member supported by said frame; a movable guide member; gear operated elevator means operably connected to said movable guide member and including a shaft; means for rocking said shaft; and adjustable brake mechanism operably connected to said shaft, whereby the movable guide member is retained in selected positions, and a tilting mechanism operably connected to said movable guide, whereby said movable guide is tilted to retain it within a bag.

3. A device for distending and gripping bags and the like during filling thereof, comprising a fixed longitudinally disposed guide plate and a movable longitudinally disposed guide plate arranged for relative movement toward and away from each other, the upper of said plates having a transversely upwardly tilted lip adapted to compress filling materials between said guides, the movable plate having a spring tilting mechanism operably connected thereto whereby, upon application of excessive plate separating force, said movable plate will tilt; a gear operated elevator mechanism operably connected to said tilting mechanism and being adapted to raise and lower said guides, and a position control element operably connected to said elevator mechanism.

4. A bag distending and supporting device and the like, adapted to support a bag from within, comprising a base; a pair of guides supported above the base and forming therebetween a chute for passage of bag filling material; an upwardly transversely extending lip on one of said guides; an elevator and a brake mechanism including a spring tension means operably connected to the upper of said guide, and a position control element operably connected to said elevator whereby the selected position of the upper guide may be held.

5. A bag distending and supporting device and the like, substantially as defined in claim 4, and characterized by gear means including a shaft connected to said position control element, said gear means being adapted to drive said elevator, and said brake means being adjustably mounted on said shaft.

6. A bag distending and supporting device and the like adapted to distend and hold a bag from within during filling thereof, comprising a rigid first longitudinally disposed flanged guide plate and a second flanged guide plate, normally parallel to the first guide plate, said second guide plate being shorter than the first guide plate and having at one end thereof an upwardly extending guide lip; an elevator mechanism, including hinge means connected to said second guide plate, and an adjustable spring tension means operably connected to said elevator mechanism, whereby excessive force of elevation on said second guide plate applied to a distended bag will cause said second plate to tilt.

7. A device for distending and supporting bags and the like from within and while in distended position to permit filling thereof, comprising a chute elevator; means in operable connection with said elevator for operation thereof; a hinge mechanism operably secured to said elevator; a pair of opposed chute members, said hinge mechanism being secured to one of said chutes; a pin secured to said last mentioned chute; a spring bearing operably connected to said elevator, said pin extending through said bearing, and a spring mounted about said pin, whereby said last mentioned chute is tiltable against the action of said spring.

8. A device for distending and supporting bags and the like from within while in distended position to permit filling thereof, substantially as defined in claim 7 wherein said elevator comprises a pair of driven upwardly extending opposed elevator members; a tie connected to both of said elevator members, said spring bearing being secured to said tie and extending outwardly therefrom, and an adjustable bearing mounted on said pin whereby tension on said spring is adjustable.

9. A bag distending and supporting device and the like adapted to support a bag from within and while distended to permit filling thereof, comprising a pair of opposed chutes in normally parallel and superposed relationship; elevator means for separating said chutes within a bag to distend the bag and grip it from within; brake means for holding the elevator means in distended position; chute tilting means for retaining the chutes within a bag, and compression means for guiding the material to be packaged between said chutes.

10. A bag distending and supporting device adapted to support a bag from within while distended to permt filling thereof, comprising a frame; a fixed chute member secured to said frame; a movable chute disposed normally parallel to said fixed chute and being opposable therefrom; gear operated elevator members mounted in said frame, said movable chute being operably connected to said elevator members; a shaft mounted in said frame, a pair of gears mounted on said shaft, and means for rotating said shaft, whereby the position of said second chute is selectively determined.

11. A bag distending and supporting device adapted to support a bag from within while distended to permit filling thereof, comprising a frame; a fixed chute secured to said frame; a movable chute disposed normally parallel to said fixed chute and being opposable therefrom, said chutes being adapted to distend and grip from within a bag mounted thereon; an elevator operably connected to said movable chute; a shaft mounted in said frame; gear

means on said shaft, and adjustable pressure means on said shaft, whereby the force required to rotate said shaft may be selectively varied.

12. A bag distending device substantially as defined in claim 11 wherein said elevator comprises a pair of opposed elevator members; a gear rack carried on each of said elevator members, said gear means comprising a pair of gears in engagement with said racks, and rack adusting means bearing on said racks.

13. A bag distending and supporting device substantially as defined in claim 12 and characterized by a bracket supported by said frame, and wherein said rack adjusting means comprises a pair of screws threaded through said bracket.

14. A bag distending and supporting device substantially as defined in claim 11 and being characterized by a first bracket carried on said frame, wherein the pressure means comprise a brake bracket having a pair of opposed arms and being secured to said first bracket; a spring disposed between said brake bracket arms, releasable pressure applying means operably connected to said brake

bracket arms; an apertured disc secured to said shaft and engaging the brake bracket, whereby the force required to rotate said shaft may be selectively varied.

15. A bag distending and supporting device and the like adapted to support a bag from within, comprising a base; a pair of guide members supported above the base and forming therebetween a chute for passage of bag filling material; an elevator mounted in said base and being adapted to separate said guide members; a brake mechanism operably connected to said elevator and adapted to hold said guide members in selected positions of separation, and a spring tension means bearing against one of said guide members whereby said last-mentioned guide member may tilt though being being held by said brake mechanism.

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