United States Patent [19]

Smith et al.

[11] **3,715,854**

[45] **Feb. 13, 1973**

[54] **BAGS AND BAG-SUPPLYING APPARATUS**

[76] Inventors: **Alexander Steel Smith,** 16, William Allen Lane, Lindfield; **Ernest Arthur Bailey,** Magnolia, Station Road, Eynsford, both of England

[22] Filed: **June 2, 1970**

[21] Appl. No.: **42,666**

[52] **U.S. Cl.** **53/29,** 53/189, 53/385, 53/391

[51] **Int. Cl.**.....**B65b 43/36,** B65b 67/12

[58] **Field of Search**.....53/29, 787–789, 53/385, 391

[56] **References Cited**

UNITED STATES PATENTS

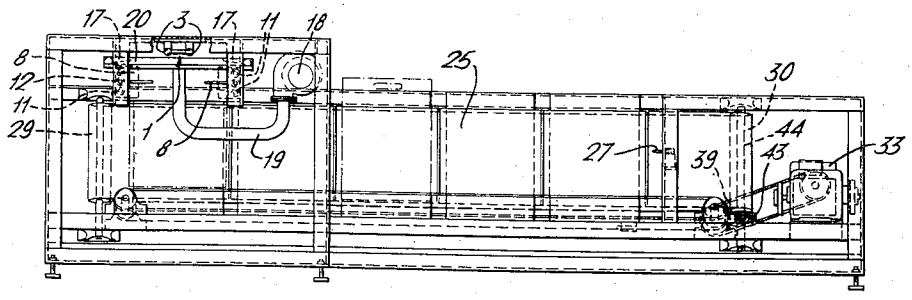
3,564,814	2/1971	Graveley	53/391 X
1,794,517	3/1931	Hellman	53/189 X
3,495,378	2/1970	Kipers	53/385 X

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Assistant Examiner—Eugene F. Dresmond
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[57] **ABSTRACT**

A bagging apparatus having means for advancing a bag in a flat or collapsed condition to a station where it can be opened for charging, means for retaining the bag in open position, mouth uppermost, and means for advancing the bag, when charged, and while retaining the charged bag in upright condition. Preferably air jet means are provided at the opening station for opening the leading bag of a spring-urged closely packed set of flat or collapsed bags on a holder means being provided for securing the front panel of that bag while the rear panel of said bag is retained on the holder. Conveyor means which can be stopped as required, e.g., at the opening and charging station, are provided for conveying the charged bag from that station.

7 Claims, 18 Drawing Figures



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SHEET 1 OF 7

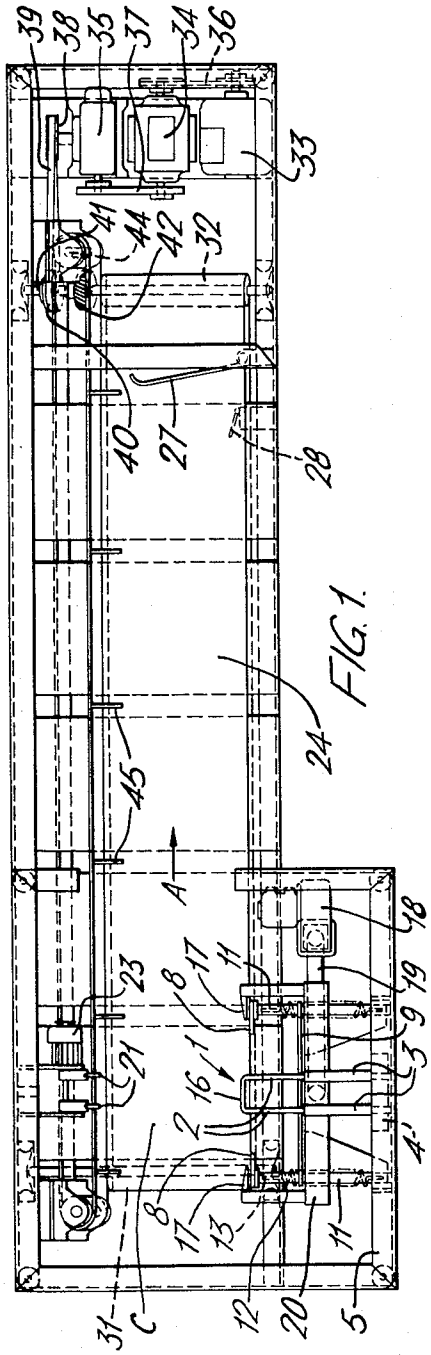


FIG. 1.

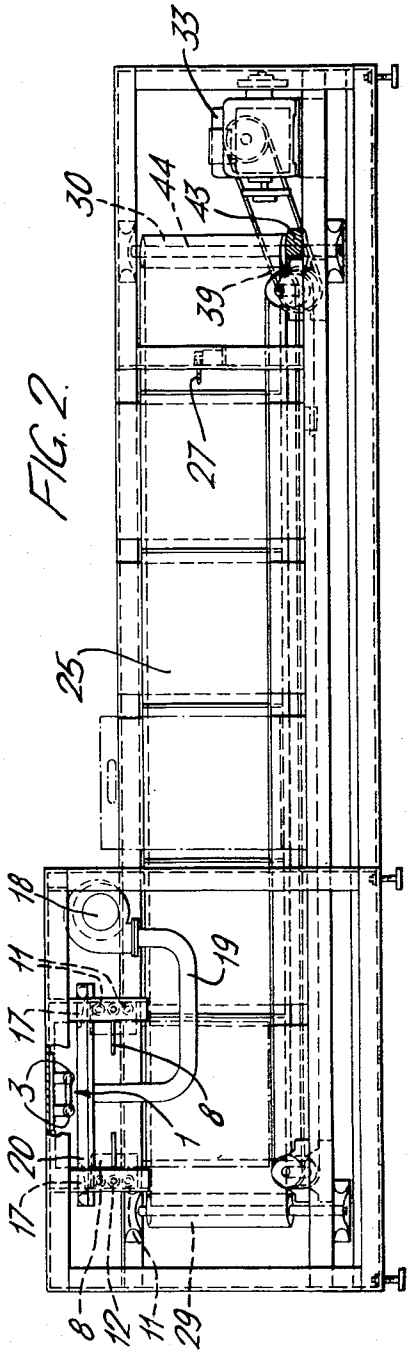


FIG. 2.

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FIG. 3.

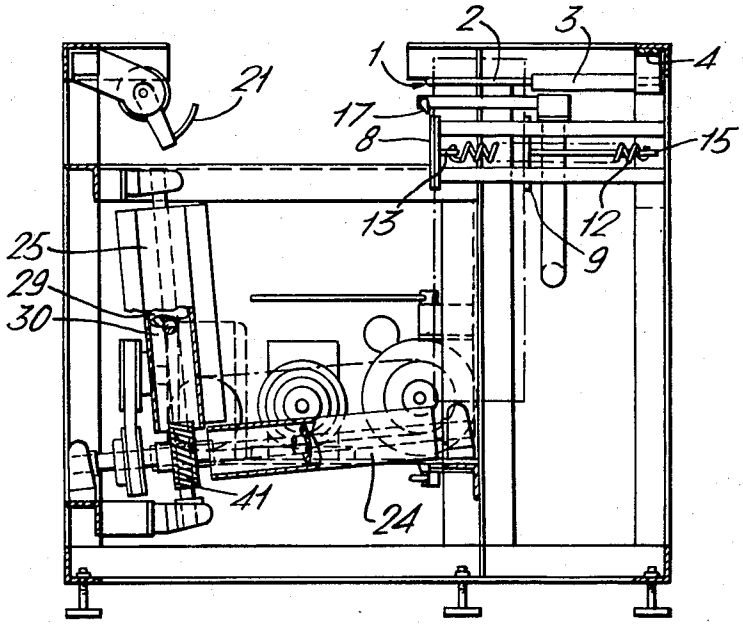
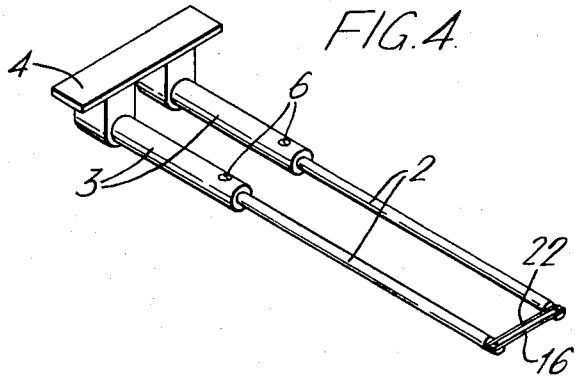


FIG. 4.



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FIG. 5.

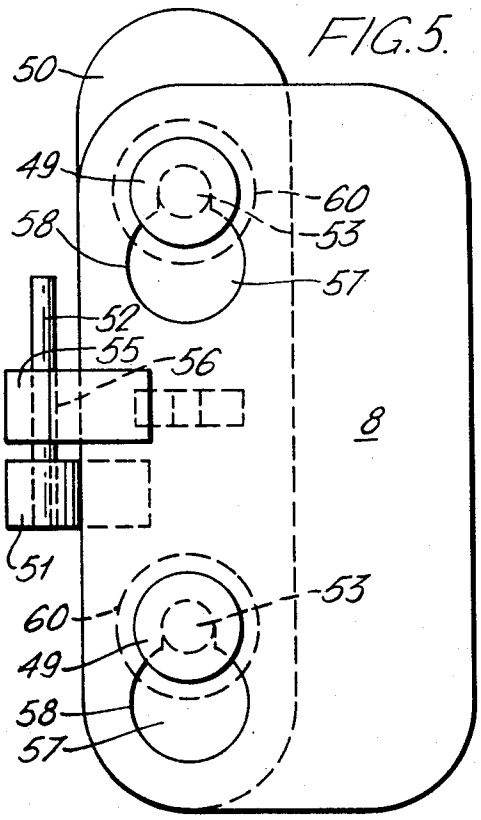


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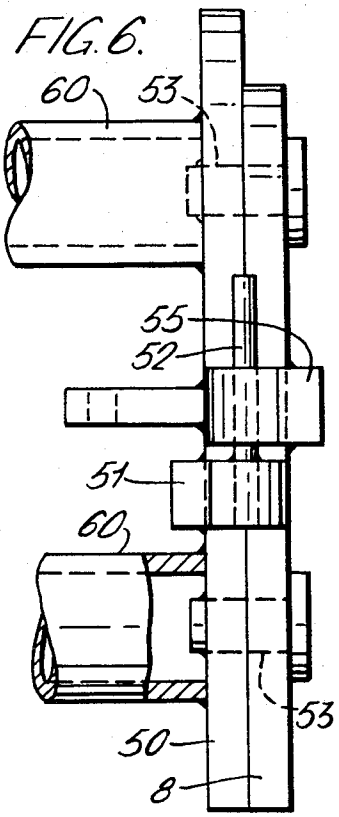
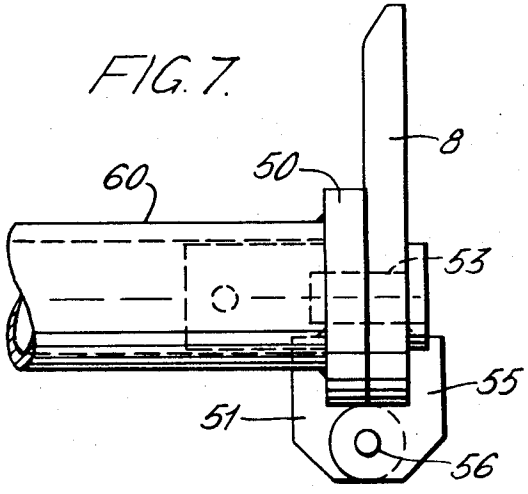


FIG. 7.



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FIG. 8.

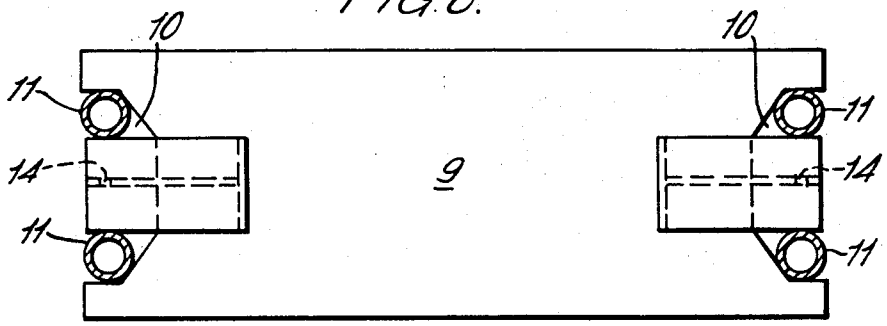


FIG. 9.

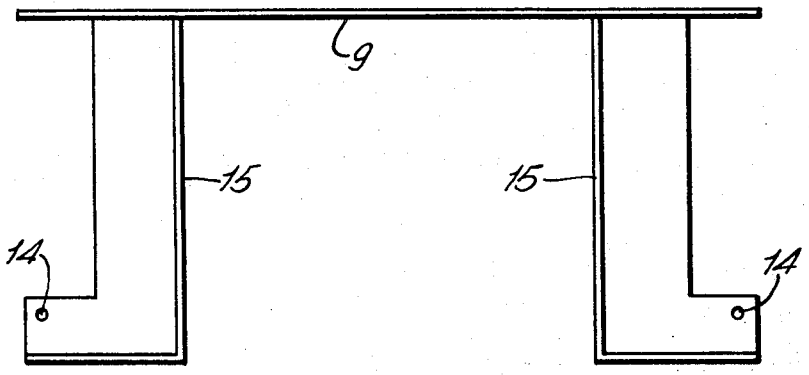
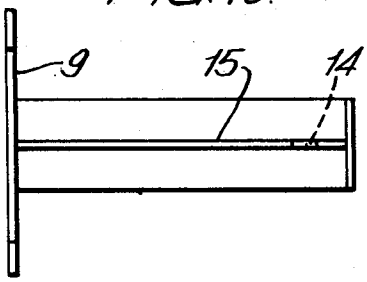


FIG. 10.



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FIG. 11.

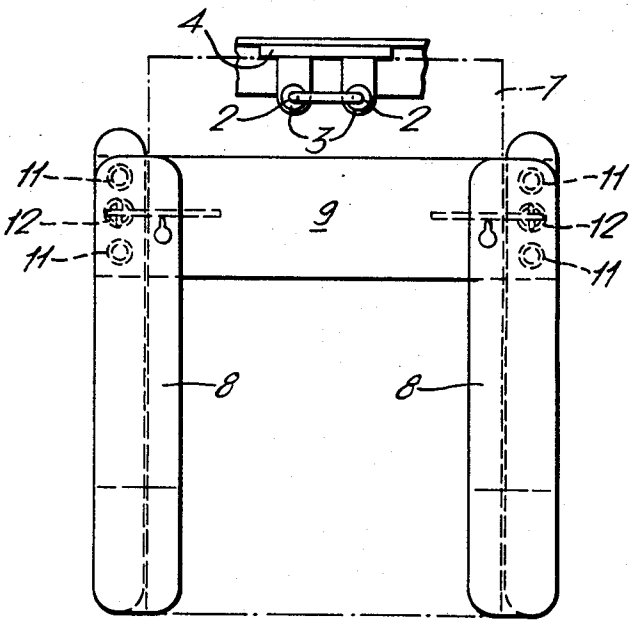
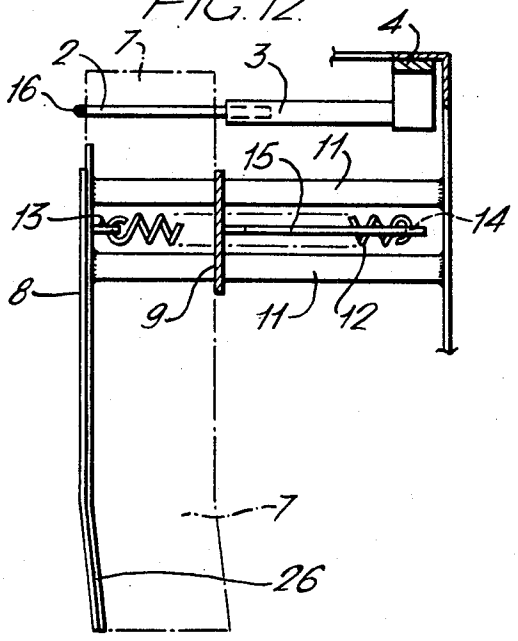


FIG. 12.



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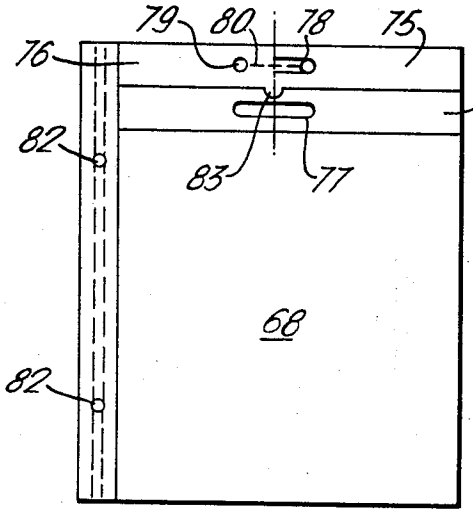


FIG. 14.

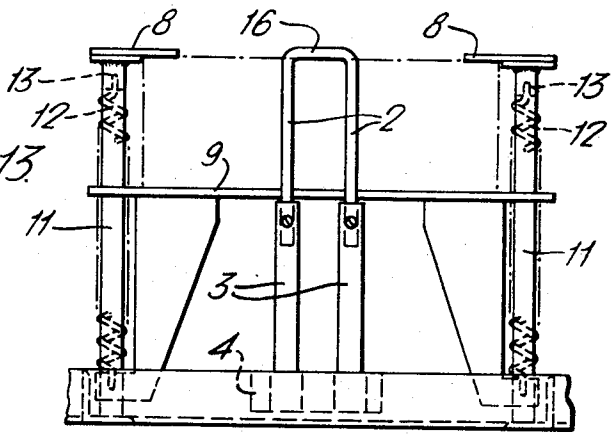


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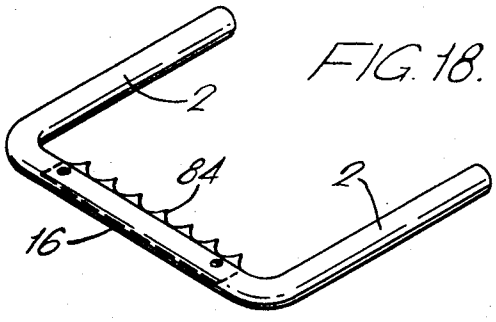


FIG. 18.

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FIG. 15.

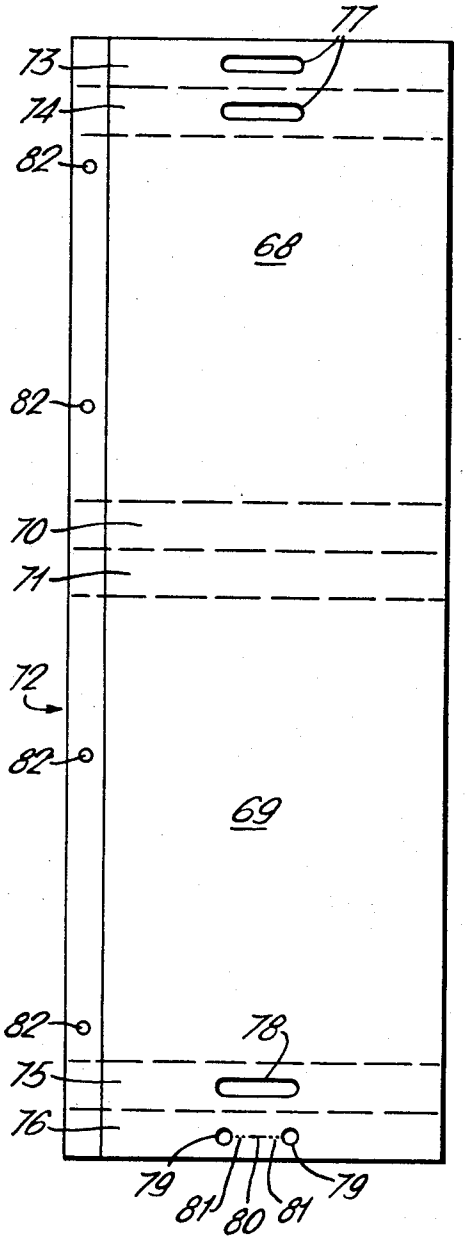


FIG. 16.

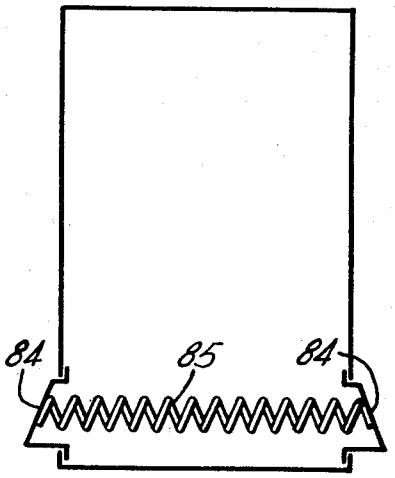
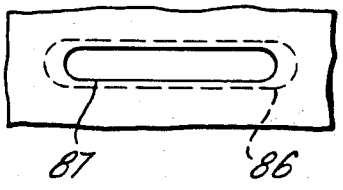


FIG. 17.



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BAGS AND BAG-SUPPLYING APPARATUS

This invention relates to bagging the bagging apparatus, as for example, for bagging purchases at the check-out points of supermarkets and other self-service stores and to bags and bag sets which are particularly designed for use therewith.

In modern supermarkets and self-service stores, the main source of congestion of shoppers is frequently at the check-out desks or counters where the goods have to be handled individually from carrier baskets or trolleys, each cash-recorded, and then collected for removal by the customer.

There is a need to accelerate the clearance of customers at this point.

The present invention provides apparatus which conduces to this end having means for advancing a bag in a flat or collapsed condition to a position where it can be opened for charging, means for retaining the bag in open position, mouth uppermost, and means for advancing the bag, when charged, while retaining the charged bag in upright condition for removal. Preferably, means, advantageously air jet means, are provided for opening the bags.

Provision may be made for advancing flat or collapsed bags successively to an opening station which may also be the charging station, where one bag may be opened and separated from a set of flat or collapsed bags suspended mouth end uppermost in closed order.

Such a set of bags may be held by a holder which engages apertures in the bags and which can be detached from the apparatus and re-charged with another set of bags or replaced by another charged holder when exhausted.

The holder may be in any one of different possible forms, its main function being to hold a set of flat or collapsed bags in close order and to permit the bags to be successively opened while still on the holder and to be subsequently separated from the holder. The nature of the holder depends upon whether separation of the bag from the holder involves locally rupturing material of the bag or whether the holder can be mechanically controlled to permit separation of a bag after being opened.

A simple form of holder is one onto which suitably apertured bags are threaded and which includes a cross bar which will normally retain bags on the holder but will permit an end bag to be opened or opened and charged whilst still on the holder and then to be withdrawn from the holder.

The holders may comprise a detachable U-or multi-prong fork-like structure (so-called "wicket") and the cross bar may be formed by or provided with a cutting knife so that the front (exposed) panel of an end bag of a set of bags suspended by the holder may be drawn away from the rear panel of that bag to open the bag while the rear panel is retained on the holder and so that when the bag has been charged the rear panel can be pulled off the holder, if necessary by locally rupturing the material thereof to facilitate the draw-off operation. Alternatively, the cross-bar could be a transverse connecting bar forming a frame with a U or multi-prong fork-like structure. As will later be described the invention includes a novel construction of bags to facilitate the removal of the leading bag, after being opened and charged, past the cross bar by rupture of material of the bag.

The holder may be supplied with an appropriate number of bags, e.g., 200, suspended in close order thereon.

If the holder be mechanically controllable, one side panel of the bag may be apertured, e.g., slotted, to pass over the holder when the bag is opened and the other side panel of the bag so differently apertured, e.g., slotted, that at the same time it will be retained by a part of the holder which can be operated after the bag has been opened or opened and charged to permit that other side panel of the bag to pass off the holder. For example, the holder may have spring loaded latches which allow an apertured part of one side panel of the bag to pass while holding back the other side panel around a smaller aperture therein. These latches might be so lightly loaded that they can be moved inwards by pulling off the bag, or they could be operatable by a suitable means, e.g., by flexible, control. Alternatively means independent of the holder may be provided for holding back one panel while the other is being displaced in opening the bag. For example, means may be provided to co-operate with a projecting top margin of the panel to be retained, or that panel could have side margins which could be engaged by suitable lateral stops or stops and locating members and/or grippers may be provided for securing the bag while being opened.

If the bags are engaged by the wicket only locally at a medial zone in the top region thereof or in the upper projecting margin of a longer panel, the sides of the bags, when these are of a flexible or flaccid character, tend to flop over and this would interfere with the smooth working of the apparatus. We therefore prefer to provide side stops which may be of a strip like character vertically disposed. Such strip-like stops may be swept back in their lower regions to keep the bottoms of the suspended bags clear of the open bag. When the bag is charged at the opening station an overall reduction of the width of the bag may, in general, occur and this facilitates the easy transition of the charged bag past the side stops when the bag is withdrawn from the holder. The stops may be pivoted about vertical axes so that they can be swung back to permit removal of an empty wicket and the fitting of a new charged wicket. The stops may be spring-loaded.

The apparatus may include a press-plate which is spring-urged to hold the set of flat collapsed bags up to the stop position. The press-plate may be guided by side rods or tubes and be retractible to permit re-charging of the holder.

Another way of holding the set of suspended bags on the holder up to the stop position so that the leading bag can be opened, e.g., by appropriately arranged air jets, is by way of collapsible or expansible cross-links or lazy-tongs connected to a press-plate and a fixed carrier, and having means such as spring means, normally tending to cause the press plate to apply pressure to the set of bags located between the plate and the stop or stops.

Having opened the bag by the air jets with the mouth of the bag uppermost, one side panel of the bag will be retained on the holder and the other side panel may be engaged with a retaining hook or hooks. Having charged the bag, preferably at the opening station, the charged bag should now be conveyed from the charging station for removal from the apparatus and to free

the opening and charging station. The bag should be maintained with its mouth uppermost until it is removed by the customer. These requirements may be fulfilled by means of an endless bottom conveyor which supports the charged bag and side support means, which may be a second endless conveyor, against which the charged bag or bags can lean during conveyance. One side of the bottom conveyor may be free to permit withdrawal of a charged bag or a further side conveyor may be provided and suitable withdrawal gap left. The conveyors may be moved intermittently and stopped for charging or whenever a free space is not available.

Another way of ensuring that the charged bag or bags shall be kept upright until removed by the customer, is for the bags to be appropriately holed, e.g., in a side margin or margins, to accommodate support rods in the apparatus. These rods may be constructed to guide the charged bag, or to advance and carry the charged bag with them, to a position in which the charged bag is to be removed by the customer. The support rods may then be retracted, and any appropriate mechanism may be provided for advancing and retracting the said rods.

To enable the support rods to co-operate with the bag in the manner desired, the bag may be provided with one or more holes to engage the rod or rods, preferably holes along one or both side margins of the bag, and preferably along sealed double-or multi-thickness side margins with the holes vertically spaced. A pair of support rods may be arranged along one of each side of the apparatus and one spaced above another to pass through corresponding holes in the bag. The holes and the rod cross section may be circular or otherwise.

The support rod or rods could be elsewhere situated, e.g., to engage a hole or holes in the top of the bag.

Although fixed side support rods are not excluded, it is preferable that such rods should advance and eventually be retracted. The conveyor will ride under the charged bag until this is released for conveyance.

One or each said side margin of the bag could be stiffened by longitudinally ribbing or corrugating or the like.

Release of the bag at the charging station may be by removal from hooks as aforesaid or by withdrawal of the hooks. As the rear panel is drawn off the holder, it may be locally ruptured as aforesaid if it has to be forced over the cross bar. At the same time it will provide a finger hold for when the bag is to be carried off by the customer. The hooks aforesaid may be engaged by a finger-hold aperture in the other panel. Rupture of the material may be assisted by weakening the material of the retained panel between holes therein which are engaged by the wicket. The smaller the amount of material to be severed or fused (depending upon whether a cutting or a fusing device is present) the easier the rupturing operation. Alternatively the retained panel can be freed for displacement off the holder by mechanically controlling the holder as aforesaid without involving rupturing the bag material.

One or more of the conveyors, and preferably the side conveyor, may be provided with dividers, e.g., in the form of projecting flaps or fingers which can separate one charged bag from another.

These flaps or fingers could be foldable if desired.

The apparatus may include other means than a wicket as aforesaid for suspending any appropriate number of bags, and/or for adding to the suspended series as and when necessary, and may include means or producing the bags, e.g., from the web, such as a rolled web, or from sheets.

The invention includes within its scope carrier bags of novel construction for use in apparatus according to the invention.

According to one embodiment the bag is characterized in that it is so apertured in its mouth region, preferably in a projecting margin of one panel of the bag, that it can be suspended on rods, as of a wicket aforesaid, and be retained by a cross bar, e.g., of the wicket, and is so formed that it can be ruptured at a predetermined region or regions to enable it to be withdrawn past the cross bar. It may have spaced holes and between these holes but not extending to the holes a cut or slit line and/or perforations so that when the material is ruptured in line with the slit or perforations the slit runs into the holes which limit the tear. There may be one or more weakened lines which permit a continuous rupture from the holes to an edge or a complete or partial rupture of the area containing the holes may be easily effected so that the bag can be withdrawn past the said cross bar. The spaced holes may be formed in one or more plies of a double or multi thickness projecting margin within the contour of a finger-hold slot in the other thickness(es) of said margin. The air jets can be directed onto this margin and opening of the bag facilitated, or the upper margin of the front panel of the bag may be notched so as to expose an area or areas of the rear panel which is retained on the holder and upon which the jets can be directed. According to another embodiment a separate strip piece which contains the holes and is adapted to be readily ruptured is situated between plies of the bag or is attached to the bag, e.g., over a slotted area of the margin of the bag, or so as to form an added margin of the bag. Such a separate piece may be formed of different material from, e.g., material more easily rupturable than, the material of the bag and the hand holes may be in the body of the bag. Such an added piece may be fused or otherwise secured to the body of the bag.

Where the apparatus has spaced support rods the bag as previously stated may be provided with spaced holes to receive the support rods.

According to one example of a form of bag-set holder which is adapted to hold a bag thereon when it is being opened, and which enables the bag to be withdrawn from the holder without rupturing the bag material, the holder is provided with side spring loaded latches. The aperture in one panel, e.g., in a smaller panel may be sufficiently large to pass the latches which however will retain the other panel of the bag which contains a smaller aperture. The latches can be forced or drawn inwards to enable the panel with the smaller hole to pass when the bag has been opened and charged. Alternatively, a finger aperture in one panel may be clear of the holder and the other aperture be provided in a marginal top extension of the other panel and be such as to be retained by the holder until this is operated for release.

According to an alternative arrangement fingers or other suitable inserts could be provided for holding the bag upright and these fingers travel with the bag to the removal station.

While a suitable mechanical device such as is hereinbefore described will usually be provided for maintaining a set of bags in the desired close order in the apparatus, hydraulic, pneumatic or electrically controlled means could be provided for this purpose.

The wicket may be designed for quick connection or disconnection, e.g., the side limbs of the wicket may be constructed, e.g., with recesses or annular grooves to telescope into fixed tubes of the holder and snap into engagement with springs or spring-loaded members, e.g., by a push-in action, and be disengaged e.g., by a pull-out force.

As a further alternative, suitable suction means could be provided for opening the bags and/or holding them open.

The bags may be made of any suitable plastics, or of paper, or of paper and plastics.

In order that the apparatus and a bag according to the invention can be the more readily understood, reference is hereinafter made to the accompanying drawings in which:

FIG. 1 is a plan view of the apparatus:

FIG. 2 is a side elevational view thereof:

FIG. 3 is an end elevation, partly in section.

FIG. 4 is a perspective view of a suitable form of wicket.

FIGS. 5, 6 and 7 are respectively front, side and plan views of one of the stop plates hereinafter referred to;

FIGS. 8, 9 and 10 show in front elevation, plan and end view the pressure plate hereinafter referred to;

FIGS. 11, 12 and 13 show the relation between the wicket the pressure plate and the stop plates, the stop plates being of a modified form;

FIG. 14 is a view of one suitable form of bag for the purposes of the invention; and

FIG. 15 is a view of the blank from which the bag is produced;

FIG. 16 is a modified form of wicket; and

FIG. 17 shows how the bags may be apertured to co-operate with such a wicket;

FIG. 18 shows another form of wicket.

Referring to the drawings, a set of bags which may be of polyethylene, polypropylene or other plastics material, or a combination of paper and plastics material, and be of a flexible character, is held suspended by a holder comprising a wicket 1, the parallel side limbs 2 of which are telescoped in supporting tubes 3 carried by a bracket 4 which is fixed to the frame 5 of the apparatus. The wicket 1 is detachably secured in the supporting tubes 3 by grub screws, spring-loaded balls or in any other suitable manner, as indicated by the numeral 6 in FIG. 4 engaging the limbs 2:

A set of bags 7 is indicated in FIGS. 11 and 12. This set of bags is located on the side limbs 2 of the wicket the bags being suitably apertured for this purpose as will be later described, and the bags are held in place on the wicket by side stop plates 8 which will be later described.

The set of bags is urged to stop position by a press-plate 9, which, as is more clearly shown in FIG. 8, has end cut outs 10 to co-operate with frame tubes 11 for guiding the press plate towards the stops. The press-plate is urged towards the stops by extension springs 12 (FIGS. 2 – 13) which are anchored at one end 13 to the frame of the machine and at the other end are anchored in eyelets 14 at the end of the rear projections 15 of the press-plate.

The leading bag, i.e., the next to be utilized, will lie adjacent to the cross bar 16 of the wicket.

One or more air jet delivering nozzles 17 are arranged to be supplied continuously or intermittently with air under pressure from a blower 18.

Air is fed by way of a flexible hose 19 to a manifold 20 and the two opposite nozzles 17.

The leading bag is blown open by the jets from the nozzles 17 and the operator places the top of the front panel of the bag over hooks 21. The finger hold opening (later referred to) in the top margin of such panel can engage the hooks. The rear panel is retained on the wicket when the bag is blown open.

The cross bar 16 of the wicket is provided with a cutting plate 22 (see FIG. 4) for the purpose later described. The cutting plate may be provided with a serrated cutting edge. The cutting plate may be arranged in recess in the cross bar.

With the bag blown open and held, the operator proceeds to check the purchases in the normal way, and having checked and noted the prices of articles purchased, also places the articles purchased into the opened bag.

When the bag is filled as required, the operator pulls the rear panel of the opened bag clear of the wicket (or appropriate means are provided for performing this operation), the bag or the wicket being suitably formed to facilitate this operation as is later described. The hooks 21 are withdrawn by operating solenoid 23 before or after the bag is pulled clear of the wicket, or the two operations may proceed simultaneously.

Two endless conveyors 24, 25 are provided, the conveyor 24 being a base conveyor set at a small angle to the horizontal (FIG. 3) and the other conveyor 25 being a side conveyor at substantially right angles thereto and therefore being at a small angle to the vertical.

The wicket is situated transversely in relation to the conveyors as is readily to be seen from FIG. 1. The bags when of a flaccid character and being only held medially on the wicket tend to sag forward at each side. The stop plates 8 serve to retain the bags against the tendency.

As the bag is filled its width may be reduced and the bag may thus come free from the stop plates 8. The stop plates 8 may be modified as shown in FIGS. 11 to 13 so that the plates are swept back to 26 (FIG. 12) so as to facilitate holding the bags on the wicket clear of the opened bag being charged.

The bag, open mouth uppermost, seats on the bottom conveyor 24 and rest against the side conveyor 25. The conveyor is held stationary during charging of the bag. It is conveyed in the direction of the arrow A (FIG. 1) from the charging station C and can move as far as the pivoted arm 27 which controls a micro switch 28. Charged bags can be removed from the conveyor laterally and if a bag has reached the pivoted arm and displaced it, the conveyors will stop. This ensures that stopping will occur if the conveyor is fully loaded up to the including the charging station.

The conveyors prevent the charged bag from falling over laterally in either direction during filling and conveying. An additional conveyor on the other side could be provided if desired.

The side conveyor **25** travels round end drums **29** and **30**, and the base conveyor travels round end drums **31** and **32**. The drive of the drums **30** and **32**, is by a motor **33** through an electro-magnetic clutch-brake **34** and reduction gear **35**, by way of belt drives **36** and **37**, the output shaft **38** driving a belt **39** and a pulley **40** on the shaft **41** of the driving drum **32** of the base conveyor. This shaft carries a worm gear **42** which meshes with a worm gear **43** on the shaft **44** of the driving drum **30** for the rear conveyor **25**.

The side conveyor **25** is provided with divider elements **45** which serve to separate one charge bag on the conveyor from another. These divider elements may be hinged so as to be foldable against the conveyor, but if sufficient clearance is provided to permit their travelling round with the conveyor in their operative position, hinging is unnecessary.

Appropriate conventional type switching mechanism (not illustrated) is provided, pedal-operated by the operator, to stop the conveyors when a bag is to be filled. When the bag is charged the rear panel is pulled off the holder and by a second depression of the pedal the hooks engaging the front panel of that bag are withdrawn and the conveyor re-started.

The side stops **8** previously referred to are illustrated in more detail in FIGS. **5** to **7**. They each comprise a fixed mount plate **50** having a fixed bracket **51** carrying a pin **52** and upper and lower headed pins **53**. The stop in the form of plate **8** is provided with a similar bracket **55**, and having an aperture **56** to engage the said pin **52**. The stop plate is provided with key-hole openings **57** the larger openings **58** of which can be passed over the heads of the pins **53**, and the plate dropped into a position in which the smaller parts of the key-hole apertures engage the pins **53**. The stop plates will thus be firmly located projecting at right angles from the side tubes **60** of the machine frame. However, when it is desired to remove a wicket or apply a newly-charged wicket each stop plate **8** can be raised and then turned about the pivot **52**, through say 90°.

One suitable form of bag is now described with reference to FIGS. **14** and **15**.

The bag may be made of any of the materials hereinbefore described. It comprises panels **68** and **69** and may be made from a blank as shown in FIG. **15** so as to form a bottom gusset from the strip-like regions **70** and **71**.

At one side **72** the material is folded to double or multi-thickness and if desired both sides may be so formed although doubling of the side margins is not essential.

The end margins, which will form the mouth of the bag are formed from strips **73**, **74** and **75**, **76** which are doubled and adhered together. Elongated holes **77** are provided in the strips **73**, **74** which are to form the mouth margin of the smaller panel **68** and the strip section **75** is formed with a similar hole **78**. The other strip section **76** which together with section **75** is to form the doubled mouth margin of the longer panel **69** is formed with spaced holes **79** between which the material is weakened by a medial slit **80**. Perforations **81** may be provided between the slit and the holes.

The spaced holes **79** in one thickness and the elongated opening **78** in the other will lie in the doubled top margin **75–76** of the longer panel projecting above the double margin **73**, **74** of the smaller panel.

The set of bags on the wicket will have the parallel limbs of the wicket extending through the holes **79** and through the elongated opening **78** and the material between the holes **79** will normally ensure that no bag falls off the cross bar of the wicket.

In case support rods are present the holes **82** are provided to engage the rods and keep the bag upright when opened and charged, when freed from the wicket. If these holes are not required it is not necessary to provide double thickness side margins.

When the longer panel is to be withdrawn from the wicket the cutting knife **22** will severe the material completely between the holes **79** to enable the longer panel to pass the cross bar of the wicket.

The mouth edge of the smaller panel may be provided with a notch **83** to facilitate the action of the air jet in blowing open the bag. A notch is particularly desirable if the panels are of the same length.

Instead of forming carrying apertures in the bag, carrying handles of suitable form may be made separately and attached by stitching, heat sealing, gluing or otherwise, or formed by folding and securing suitable parts of the body of the bag. Where a rupturable insert or addition is provided, this may form the handle.

FIG. **16** shows a form of holder which can be mechanically controlled to hold back one panel of the bag while the other panel is opened and to permit release of the bag from the wicket without any rupturing of the bag material. The wicket is of hollow construction at least at one end where it is formed with a latch **84** at each side, the latches being urged outwardly by spring **85** to the position shown. When one panel of the bag is provided with an aperture **86** and the other with a smaller aperture **87**, (see FIG. **17**), the forward panel with the larger aperture **86** can be pulled off the holder whilst the other panel is retained by the latches. When the latches are drawn inwards the rear panel can be moved off the holder.

In the modified form of wicket shown in FIG. **18** a serrated edge cutter **85** is attached to the cross bar **16**.

The release of the hook or hooks aforesaid may be coordinated with the displacement of the latches or other equivalently functioning means on the holder, e.g., operation of the one may, for example, through electrically or mechnically controlled means release the other.

Although the holder has been arranged transversely in the form illustrated, it may be arranged in line with the conveyor on which the bags are loaded.

The bags may be held on stored wickets by end plugs or grommets on the free ends of the limbs thereof, if desired with a backing sheet or board, and these removed when the wicket is to be pushed into the tubes of the holder.

We claim:

1. A bagging apparatus operable with a set of adjacent collapsed or flat bags each having a front panel provided with a finger-hold aperture in the upper part thereof and a rear panel with spaced holes in the upper part thereof and a supporting holder, said holder comprising spaced rods passing through said holes and a

cross piece to retain the bags against movement off one end of the holder, the material of the rear panel between the holes being rupturable in withdrawing a charged bag from the holder to provide a further finger-hold aperture, said cross piece having means for so rupturing the material of said charged bag between said spaced holes therein, the apparatus comprising means for supporting such a holder, means for advancing the set of bags into a position where the leading bag can be opened for charging, means for opening the said leading bag and means for advancing the bag, when charged, and while retaining the charged bag in the upright condition.

2. A bagging apparatus comprising a holder supporting a set of adjacent collapsed or flat bags each having a front panel provided with a finger-hold aperture in the upper part thereof and a rear panel with spaced holes in the upper part thereof, the holder having spaced rods passing through the said holes and a cross piece to retain the bags against movement off one end of the holder, the material of the rear panel between the holes being rupturable by withdrawing the charged bag off the said end of the holder to enable the bag to pass the cross piece and form a further finger-hold aperture, means for advancing the set of bags to a position where a leading bag of the set can be opened for charging, means for opening the leading bag by moving a front panel thereof away from the rear panel thereof, said cross piece having means for so rupturing the material of the said charged leading bag between said spaced holes, and means for advancing a charged bag while retaining the bag in an upright condition.

3. A bagging apparatus having means for advancing a bag in a flat or collapsed condition to a position where it can be opened for charging, a holder for a set of the bags, side stops for the bags on the holder, said stops being formed by plates or strips carried by the frame of the apparatus and against which the side margins of the front bag of the set on the holder are urged, the plates or strips being swept back at their lower margins towards the rear of the holder.

4. A bagging apparatus having means for advancing a bag in a flat or collapsed condition to a position where it can be opened for charging, means for retaining the bag in open position, mouth uppermost, and means for advancing the bag, when charged, and while retaining the charged bag in upright condition, said latter means including a bottom endless conveyor for supporting and conveying the charged bag and means for ensuring that the charged bags remain upright on the said conveyor, said latter means comprising a side endless conveyor.

5. Apparatus as in claim 4 in which the means for ensuring that the charged bags remain upright on the conveyor include side rods which are engaged by apertures in the sides of the bags.

6. Apparatus according to claim 4, in which said bottom and side conveyors are set at an angle to the horizontal and vertical respectively so that the charged bags will lean on the side endless conveyor while supported by the bottom conveyor.

7. A method of bagging which comprises

1. holding a set of flat bags in close order threaded on a holder, each bag having a front panel provided with a finger-hold aperture in the upper part thereof and a rear panel provided with spaced holes in the upper part thereof and the holder having spaced rods passing through said holes and a cross piece to retain the bags against movement off one end of the holder;
2. continuously urging said set up to said cross piece;
3. opening an end bag of the set and charging that bag while retaining it on the holder;
4. withdrawing the charged bag off the holder and in so doing rupturing the material of the rear panel between the said holes to form a further finger-hold aperture and to enable the rear panel to pass over the cross piece of the holder; and
5. mechanically feeding the charged bag to a withdrawal station.

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