

[54] **DROP-DOWN FILL SPOUT FOR BAG FILLING MACHINE**[75] Inventor: **Doyle R. Hudson**, West Monroe, La.[73] Assignee: **Okinkraft Inc.**, West Monroe, La.[22] Filed: **Mar. 23, 1973**[21] Appl. No.: **344,120**[52] U.S. Cl. **141/10, 141/114, 141/316, 177/160**[51] Int. Cl. **B65b 1/04, B65b 3/04**[58] Field of Search **53/187, 188, 386; 141/10, 141/67, 68, 114, 165, 166, 181, 182, 269, 281, 311-317, 350, 359, 369-372, 383, 387, 388, 390, 391, 136, 140, 148, 149, 172, 253, 257, 262, 263, 270, 275-278; 177/160**[56] **References Cited**
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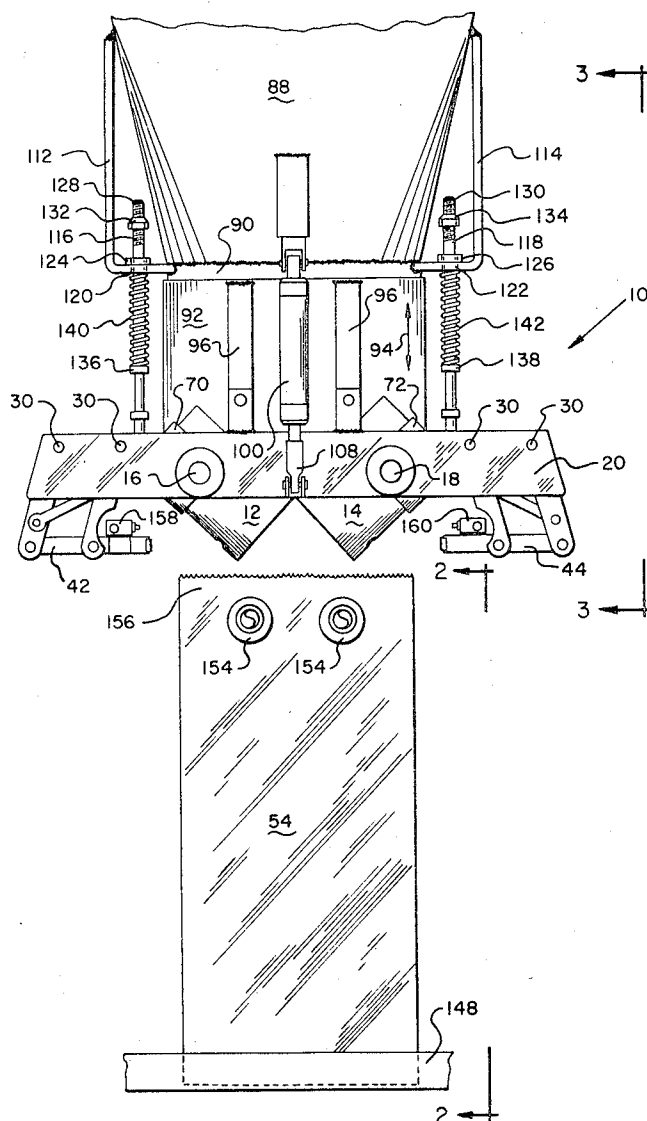
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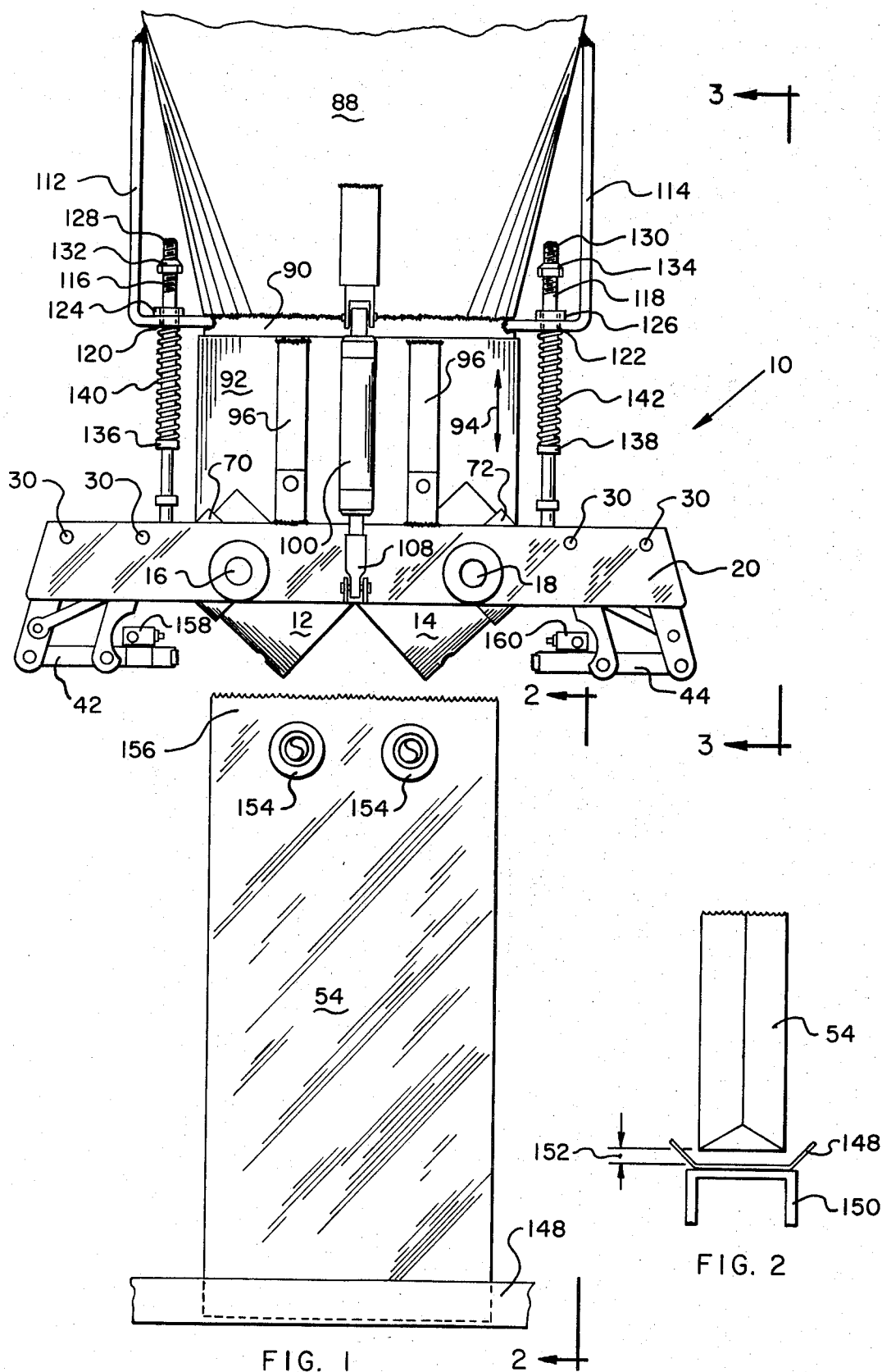
Primary Examiner—Houston S. Bell, Jr.

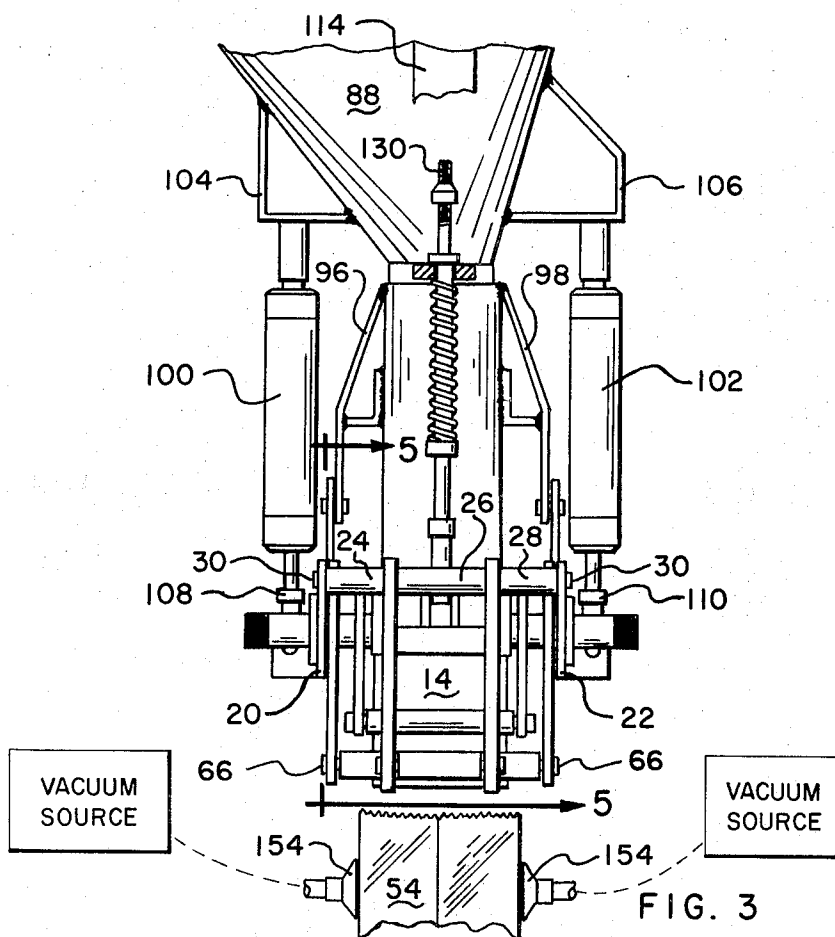
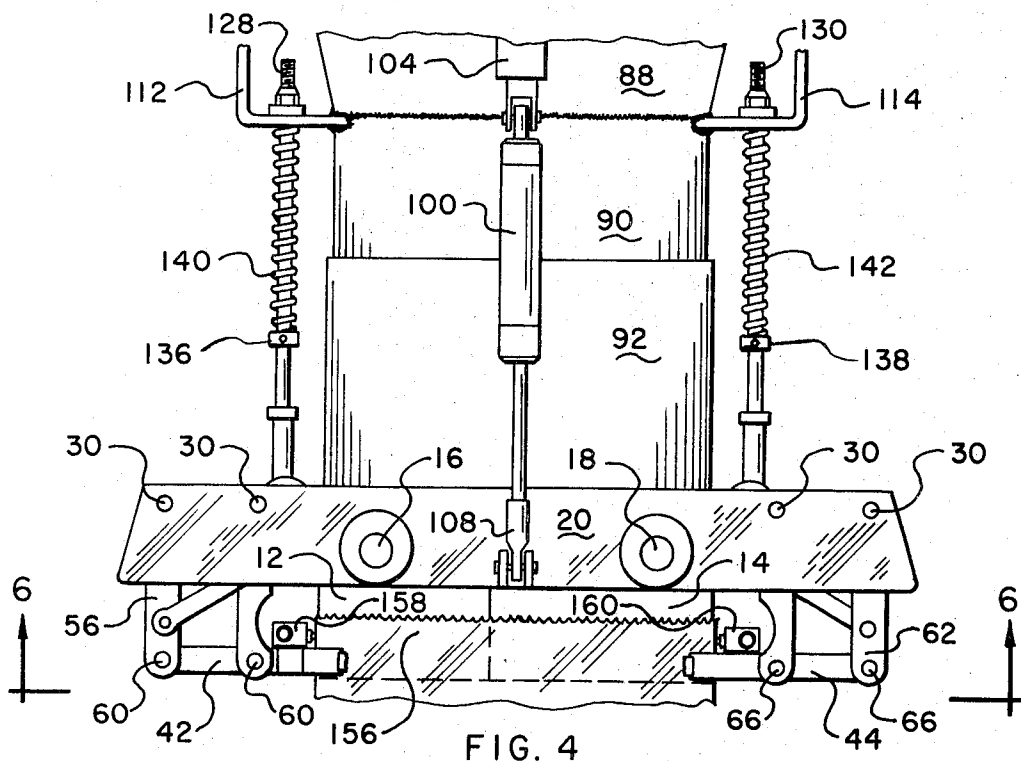
Assistant Examiner—Frederick R. Schmidt

[57] **ABSTRACT**

An improved filling spout for a bag filling machine of the type wherein a plurality of articles are filled in a rapid sequence in a bag which is subsequently closed. The novel filling spout is dropped down into the pre-opened bag and is pivoted outwardly against the inner walls of the bag while an external gripper means is pivoted inwardly against the external walls of the bag thereby firmly grasping the bag between the gripper means and the filling spout. The linkage which relates to the filling spout and the gripper means is designed so that the weight of the product increases in the bag, the effective result is an increase in the pressure between the filling spout and the gripper means. The novel configuration of the filling spout, in the shape of a pair of pivotable overlapping clamshells, minimizes spillage and reduces unpleasant dust that occurs during the filling operation especially when filling the bags with charcoal or the like.

13 Claims, 6 Drawing Figures





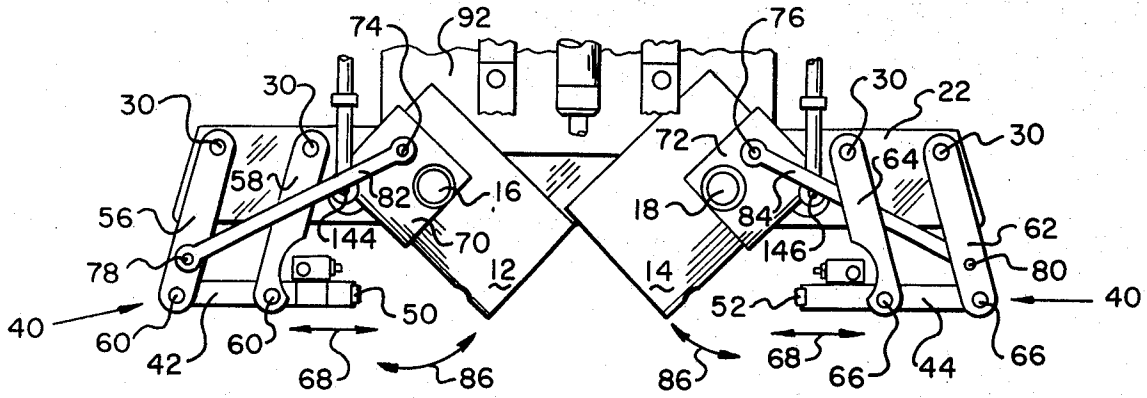


FIG. 5

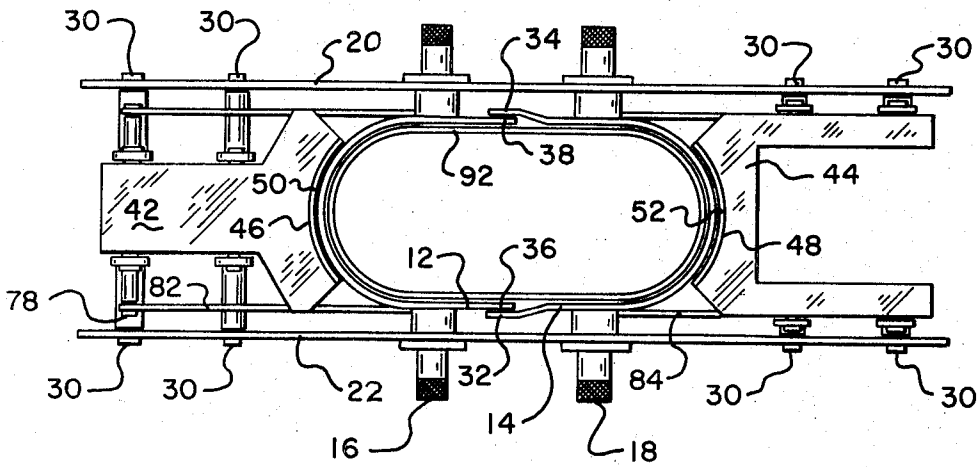


FIG. 6

DROP-DOWN FILL SPOUT FOR BAG FILLING MACHINE

CROSS REFERENCES TO RELATED APPLICATIONS

U.S. Pat. No. 3,698,451, issued Oct. 17, 1972 to Doyle R. Hudson and entitled "Automatic Bag Opening and Filling Apparatus."

BACKGROUND OF THE INVENTION

U.S. Pat. No. 3,750,721, issued 8/7/73 to Doyle R. Hudson and entitled "Expanding Fill Spout for Bag Filling Machine."

U.S. Pat. No. 3,755,986, issued 9/4/73 to Doyle R. Hudson and entitled "Gusset Reformer."

U.S. Pat. No. 3,796,300, issued 3/12/74 to Doyle R. Hudson and entitled "Multiple Finger Pushers."

This invention relates generally to a filling machine for filling a bag or other objects with a plurality of items contained within a filling spout positioned above the filling machine. More particularly the invention relates to an improved new and novel drop-down fill spout which is lowered into the pre-opened bag and is then pivoted to its filling position while a plurality of gripper means are positioned on the outside of the bag to firmly grasp the bag against the expanded fill spout to hold the bag firmly in place while the bag is filled from the filling hopper.

In the operation of filling large and bulky objects in a bag, such as charcoal briquettes commonly used in outdoor cooking and such as large chunks or cubes of ice, the problem of coordinating the filling operation with the placement of the bag to be filled on the fill spout has been long felt. Prior art filling machines, of one type, consisted of a one-piece fill spout formed on the bottom portion of the generally conical-shaped filling container into which was automatically placed the proper amounts of materials to be filled in the bag. In order to properly position the bag on the solid filling spout, the operator would usually open the bag by hand and position either the bag around the filling spout or the bag underneath the filling spout. This required the filling spout to be considerably smaller than the diameter of the bag so that the operator could attain the necessary speed in opening the bags and positioning them over the spout or so that the bag could be filled from the spout without spilling the contents on the ground. Such crude hand operations often required the fill spout to be in the range of forty per cent smaller than the opening of the bag which of course limited the amount of material that could be filled in the bag in passing through the fill spout and into the bag over a given period of time. This type of filling operation is typified by the U.S. Pat. No. 2,309,760, issued Feb. 2, 1943 to G. B. First.

Another problem encountered with the hand filling operation was the use of the smaller fill spout opening which caused a bridging of the articles being filled with the spout. Since the opening was considerably smaller than the bag diameter, the objects being filled would tend to hang up in the spout thereby slowing down the filling operation or resulting in a bag which was either overfilled or underfilled depending upon the timing sequence of the filling circuit.

Reference should be also made to U.S. Pat. No. 2,350,554, issued June 6, 1944 to C. H. Hartman et al.,

which shows another variation of the filling machine wherein the bag is raised up to the filling spout by a hand operation. In a similar manner the U.S. Pat. No. 2,585,335, issued Feb. 12, 1952 to C. B. McHale et al, again utilizes the hand technique by placing the sack upside down on a plurality of sack carriers.

For a further study of prior art filling methods reference should be made to the following patents which represent variations of filling machines all of which attempt to solve the same basic problem of filling the bag as fast as possible with a predetermined amount of articles without having any resulting jamups in the equipment:

U.S. Patent No.	Issue Date	Patentee
2,689,073	9/14/54	R. W. Twigg
2,768,493	10/30/56	H. Holler
2,781,620	2/19/57	F. L. Hopkins et al.
2,973,612	3/7/61	W. S. McGowan
3,167,897	2/2/65	F. L. Hopkins et al.
3,698,451	10/17/72	Doyle R. Hudson

After reviewing the above-mentioned patents it will be noted that, with the exception of the Twigg patent, all of the prior art attempts at solving the problem appear to be utilizing hand positioning of the bag on the filling spout or raising the bag to the filling spout by automatic means or positioning the bag under the filling spout and pivoting a filling spout into the bag. For example the Holler reference is a variation of the first reference and teaches bringing the bag to the filling spout by means of a rotary motion whereupon the contents are poured through the filling spout into the bag. It should be noted that this arrangement would be unsatisfactory for packaging charcoal or the like since there is no means for sealing the dust and small particles that arise when the charcoal is rapidly filled into the bag. The two Hopkins' references both utilize the principle of carrying the bag to the filling spout and positioning the bag on the filling spout generally by hand which is slow and not feasible in today's packaging design. In a like manner the McGowan reference also raises the bag into position on the filling spout but in this version the raising is done automatically by various linkages in the bag machine.

A somewhat different approach is taught in the Hudson patent wherein the bag is positioned underneath the filling spout and a plurality of opening and holding means are pivoted into the opened bag whereupon the contents of the filling spout are emptied into the bag. This version was the forerunner of the subject invention and represents the applicant's thoughts as to how the bag filling machine of the present and future will have to be designed in order to keep up with the ever increasing demand for consumer products. In the beforementioned U.S. Pat. No. 3,750,721 of Doyle R. Hudson, there is shown another version of a bag opening and filling mechanism whereby the bag is brought upwardly to the filling spout which is then expanded into the bag and the bag is held by an external gripping means while the bag is being filled. This version has proven to be satisfactory for certain sizes and types of bags, generally in the smaller sizes, but has proven to be unsatisfactory for the larger sizes and types of bags. The reason for this is that it has been found to be unfeasible to raise a large bag such as a 25 or 50 pound charcoal or ice bag upward to heights of 4 or 5 inches to the

filling spout and to hold it on the filling spout while it is being progressively made extremely heavy by the weight of the contents being filled in the bag. A drop of 4 or 5 inches would serve to reduce the positional control of the package for the later step of reforming the gussets and in the case of heavy materials such as plastic resins, grain, clay products, etc. may cause the package to rupture.

SUMMARY OF THE INVENTION

In order to overcome the problems inherent in the prior art devices mentioned, there has been provided by the subject invention a new and novel drop-down fill spout for a bag filling machine of the type that generally will be utilized to fill the larger sizes of bags. Instead of bringing the bag up onto the filling spout, the applicant's concept is to bring the filling spout downward into the preopened bag and to utilize other new and novel features to allow the larger size bags to be rapidly filled thereby obviating the problems inherent in the prior art devices. This is accomplished by automatically lowering the filling spout into a pre-opened bag and then pivoting the filling spout, which has a new and novel configuration, to a filling position within the bag while gripping the outer portion of the bag with an external gripping means. As the bag is being filled, due to the particular design of the parts, the addition of objects in the bag from the filling process serves to effectively increase the gripping pressure on the bag.

Accordingly it is an object of the invention to provide a new and novel bag filling machine which brings the filling spout downwardly into a previously opened bag and provides gripping means for gripping the outer portion of the bag while the bag is being filled.

Another object of the invention is to provide a new and novel filling machine which makes provision for substantially sealing the upper portion of the bag against the escape of dust and other airborne particles while the bag is being filled in the filling machine.

Still another object of the invention is to provide a new and novel filling machine which grips the upper portion of the bag while the bag is being filled and continually increases the pressure on the upper portion of the bag as the bag is made progressively heavier by the filled objects.

Yet another object of the invention is to provide a new and novel filling spout which is formed as a generally large slideable sleeve section which allows fast filling of the bag without resultant jamups in the filling section of the machine.

Still yet another object of the invention is to provide a new and novel method for filling bags in a filling machine which comprises positioning a bag underneath the filling bin while opening the upper portion of the bag and while lowering a plurality of pivotable clamshells into the pre-opened bag and finally pivoting the clamshells to a filling position and externally gripping the outer portion of the bag to firmly grip the bag between the clamshells and the gripping means. A further object of the invention is to provide a new and novel method whereby after the bag is gripped by the gripping means a further pressure is applied by the gripping means to firmly hold the bag on the clamshells due to the new and novel configuration of the part while the bag is being made progressively heavier.

These and other objects of the invention will become apparent from a review of the specification and from a

study of the drawings attached hereto as part of the disclosure.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side view of the new and novel filling spout utilized in the bag filling machine of the invention showing a bag positioned underneath the filling spout with the filling spout being retracted upwardly prior to insertion into the opened bag;

FIG. 2 is a view taken along line 2—2 of FIG. 1 showing the opened bag and its position relative to the dead plate of the filling machine;

FIG. 3 is a partial end view, taken along line 3—3 of FIG. 1;

FIG. 4 is a partial side view of the drop-down fill spout, showing the fill spout in its lowermost position and the gripping means being positioned around the neck of the bag to firmly position the bag between the gripper means and the clamshells;

FIG. 5 is a view taken along line 5—5 of FIG. 3 showing the drop-down fill spout in its uppermost position and showing the relationship of the pivotable clamshells to the gripper means; and

FIG. 6 is a view taken along line 6—6 of FIG. 4 showing the fill spout in its downwardmost position with the gripper means positioned inwardly to firmly grip the bag between the gripper means and the clamshells.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings in general and in particular to FIG. 1 of the drawings there is shown the new and novel drop-down fill spout device of the invention generally by the numeral 10 and comprises a pair of clamshells 12 and 14 which are pivotably mounted, by means of pins 16 and 18, to a pair of side plates 20 and 22. The side plate 20 is positioned on one side of the pair of clamshells 12 and 14 while the side plate 22 is positioned on the other side of the clamshells and is spaced apart from the first side plate 20 by means of a plurality of sleeves 24, 26 and 28. These sleeves are shown more fully in FIG. 3 of the drawing and are held in position by means of a plurality of pins 30 by means well known in the art. The pins 30 also carry a portion of the gripper means which will be more fully described hereinafter.

The clamshell 12 is formed in a generally U-shaped configuration while the clamshell 14 is formed in the same general configuration with overlapped end portions 32 and 34 which overlap the ends 36 and 38 of the clamshell 12.

Referring now to FIG. 1 and FIG. 5 of the drawing there will be described the relationship of the gripping means to the beforementioned clamshells. The gripper means, shown generally by the numeral 40 comprises a pair of gripper plates 42 and 44 having an arcuate gripper surface 46 and 48 conforming to the same general shape as the clamshells 12 and 14. The gripper surface 46 and 48 also has formed thereon a rubber gripper pad 50 and 52 by means well known in the art. The gripper pads 50 and 52 aid in gripping the bag 54 which is positioned on the clamshells 12 and 14 as will be more fully described hereinafter.

The gripper plate 42 is carried by means of the parallel bars 56 and 58 through a plurality of pins 60 as well as a plurality of pins 30 fixed to the side plates 20 and 22. In a like manner the gripper plate 44 is carried by

means of the parallel bars 62 and 64 by means of the plurality of pins 66 as well as the plurality of pins 30 which are fixed to the side plates 20 and 22. When carried in this manner, the gripper plates 42 and 44 are designed to move substantially horizontally in the direction shown by the arrow 68 as will be explained more fully hereinafter.

As beforementioned the clamshells 12 and 14 are pivotably mounted to the side plates 20 and 22 by means of the pins 16 and 18. Formed on the outer portion of the clamshells 12 and 14 are a generally U-shaped reinforcing member 70 and 72 which have fixedly attached thereto a plurality of pins 74 and 76. The parallel bars 56 also have formed there between a pin 78 while the parallel bars 62 have formed there between a pin 80. Formed between the pins 74 and 78 is an elongated linkage 82 which controls the motion of the clamshell 12 while formed between the pins 76 and 80 is an elongated linkage 84 which controls the motion of the clamshell 14. By referring to FIG. 5 of the drawing and from known engineering laws, it can readily be seen that due to the respective positioning of the various linkages and pins, a substantially horizontal motion of the gripper plates 42 and 44 in the direction shown by the arrows 68 which cause a corresponding arcuate movement of the clamshells 12 and 14 in the direction shown by the arrows 86, pivoting the clamshells 12 and 14 against the gripper plates 42 and 44.

Referring now back to FIG. 1 of the drawing and also FIG. 3 of the drawing and following with FIG. 4 of the drawing there will be described in detail how the gripper plates and clamshells are able to be positioned in their respective positions. The complete bag filling machine generally has formed above the drop-down fill spout of the invention a filling bin not shown in the drawing. Formed on the lower portion of the filling bin is a transition chute 88 which serves to direct the materials from the filling bin to the filling spout and ultimately to the bag to be filled. Formed on the lower portion of the transition section 88 is an open-ended sleeve section 90 which is surrounded by a substantially vertical slideable sleeve section 92. The slideable sleeve section 92 is designed for an upward and downward motion in the direction shown by the arrow 94 and is carried by the side plates 20 and 22 by means of a plurality of structural supporting members 96 and 98. The structural support members 96 are rigidly fastened to one side of the slideable sleeve 92 and to the side plate 20 while the structural support members 98 are rigidly fastened to the other side of the slideable sleeve 92 and to the slide plate 22 as shown in FIG. 3 of the drawing and by means well known in the art. When fastened in this manner it becomes apparent that whenever the slideable sleeve 92 moves in the substantially vertical direction shown by the arrow 94, the connected side plates 20 and 22 along with the gripper means 40 will travel in the same direction.

The movement of the slideable sleeve 92 and the gripper means 40 in the upward and downward direction is controlled by means of a plurality of pneumatic or hydraulic cylinders 100 and 102. The cylinder 100 is rigidly connected, by means well known in the art, to the transition chute 88 by means of the bracket 104 while the cylinder 102 is rigidly connected, by means well known in the art, to the other side of the transition chute 88 by means of the bracket 106. The rod end 108

of the cylinder 100 is connected to the side plate 20 by means well known in the art and in a similar manner the rod end 110 of the cylinder 102 is connected to the side plate 22. As a result it can be seen that by applying power to the cylinders 100 and 102, the slideable sleeve 92 as well as the gripper means 40 can be downwardly positioned and can be also retracted in a similar manner.

Referring now to FIGS. 1 and 5 of the drawing there will be described the manner in which the gripper means and the clamshells are positioned in their respective positions after a downwardly travel of the slideable sleeve 92. Rigidly attached to the transition chute 88 are a pair of brackets 112 and 114 which carry a plurality of threaded rods 116 and 118. The rod 116 is positioned within a hole 120 formed in the bracket 112 and in a similar manner the rod 118 is positioned within a hole 122 formed in the bracket 114. Surrounding the rod 116 is a washer 124 and surrounding the rod 118 is a washer 126. The threaded ends 128 and 130 of the rod 116 and 118 contain a nut 132 and 134 which is adjustable to stop against the washers 124 and 126 at a pre-determined position.

The rods 116 and 118 have formed in the lower portion thereof a collar 136 and 138 which serves as a base for the springs 140 and 142 which are grounded at their other ends surrounding the holes 120 and 122 in the brackets 112 and 114. The lower end of the rods 116 and 118 are rotatably mounted to a pair of pins 144 and 146 which are in turn fixedly attached to the reinforcing members 70 and 72. Due to the respective positions of the pin 144 and 146 in relation to the pivot pins 16 and 18, it can be seen that a downwardly motion of the slideable sleeve 92 in the direction shown by the arrow 94 will cause the beforementioned motion of the clamshells 12 and 14 as well as the gripper means 40.

When the slideable sleeve 92 is in its upper position as shown in FIG. 1 of the drawing and a power is applied to the cylinders 100 and 102, the sleeve will travel downwardly until the rods 116 and 118 are stopped by virtue of the nuts 132 and 134 grounding on the washers 124 and 126. Thereupon a further downward travel of the slideable sleeve 92, as well as the side plates 20 and 22, will cause the clamshells 12 and 14 to pivot around the pins 16 and 18 to their outwardly open position shown in FIG. 6 of the drawing. At the same time as a result of the linkage 82 and 84, the outward travel of the clamshells 12 and 14 will cause an inward travel of the gripper means 40 to its gripping position as shown in FIG. 4 of the drawing.

OPERATION

In operation the bag 54 is positioned underneath the drop-down fill spout as shown in FIG. 1 of the drawing and by means forming no part of this invention. When positioned in this manner it is held a pre-determined distance above a trough-shaped member 148 fixedly attached to the base 150 of the filling machine. This pre-determined distance 152 is determined by the type of bag that is being filled by the filling machine and generally ranges between $\frac{1}{2}$ inch and 1 inch. When filling a self-opening style bag, this distance is necessary in order for the bottom of the bag to be completely opened as the product is filled into the bag. When filling a sewn open mouth type bag, this distance is determined by the bag gussets since the bottom of the bag tends to lift a predetermined distance from the trough-

shaped member 148 as the bag is being filled. From this the observation can be made that, without applying complicated means to support the bottom of the bag while it is being filled, it becomes necessary to support the bag from the gripper means attached to the drop-down fill spout of the invention.

As the bag 54 is positioned underneath the filling spout 10 it is opened by means of a plurality of vacuum suction cups 154 which hold the bag open until the gripper means 40 is positioned against the opened clamshells 12 and 14 to firmly hold the bag. Thereupon the suction cups 154 return to the bag hopper, not shown in the drawing, to withdraw the next succeeding bag.

After a bag has been opened by the suction cups 154, the power cylinders 100 and 102 are activated to drive the slideable sleeve 92 and its connected parts downwardly bringing the pivotable clamshells 12 and 14 downwardly into the interior of the bag while at the same time bringing the gripper means 40 in the form of the gripper plates 42 and 44 outwardly around the upper portion of the bag. As beforementioned whenever the nuts 132 and 134 stop on the washers 124 and 126, a further downward movement of the slideable sleeve 92 will cause the pivotable clamshells 12 and 14 to pivot outwardly to their open position while simultaneously causing the gripper plates 42 and 44 to be positioned inwardly against the upper edges 156 of the bag 54 as shown in FIG. 4 of the drawing.

The gripper plate 42 as well as the gripper plate 44 also has formed thereon a sensing device 158 and 160 in the form of a microswitch which senses the presence of absence of a bag between the gripper means and the clamshells. When the sensing device 158 and 160 detects the absence of a bag, due to a malfunction of the supply mechanism, the filling sequence of the bag filling machine will be interrupted until a bag is ultimately in position on the filling spout.

After the bag 54 is in position on the clamshells 12 and 14, the filling sequence of the machine, forming no part of this invention, is started and the bag is filled with the required amount of product such as charcoal, ice or the like. During the filling sequence the power cylinders 100 and 102 continue to exert a downward force through the frame means 20. This force, transmitted through linkages, which interconnect the clamshells, the gripper plates and the fixed frame 112 - 114, produce gripping action between plates 42 and 44 and the clamshells 12 and 14, respectively, so that the empty bag 54 is securely held. The linkage which relates to the clamshells, the gripper plates and the rods 128 and 130 is such that as the weight of the product increases in the bag, the effect result is an increase in the downward pressure on the frame 20. This added force being restrained by rods 128 and 130 effectively increases the clamp pressure between the gripper plates and the clamshells.

After the bag is completely filled, the power cylinders 100 and 102 are reversed, by means well known in the art, to retract the gripping means from the clamshells which are in turn pivoted inwardly to their nonfilling position allowing the bag to drop the small predetermined distance 152 onto the trough-shaped member 148 whereupon they are ultimately sewn shut. The further reversal of the power cylinders 100 and 102 causes the entire drop-down filling mechanism to be raised to its upward position shown in FIG. 1 of the drawing

ready for the next bag and a repeat of the entire cycle.

In practicing the method taught by the use of the subject drop-down filling spout, the bag is positioned underneath the filling bin while the upper portion of the bag is opened with external means such as vacuum cups. Thereupon the plurality of pivotable clamshells are lowered into the pre-opened bag to a predetermined position within the bag and are then pivoted to a filling position within the bag while externally a plurality of horizontal gripping means is inwardly positioned on the outer portion of the bag to firmly grip the bag between the plurality of clamshells and the gripping means. Thereupon the bag is filled with the objects from the filling machine while a further filling of the bag serves to increase the pressure holding the bag between the gripping means and the clamshells and a horizontal retracting of the gripping means allows the bag then to drop a small pre-determined distance to the datum plane of the filling machine. Whereupon the clamshells are also pivoted inwardly and raised to the non-filling position ready for a repeat of the cycle with the positioning of the next bag underneath the filling spout.

From the above it can be seen that a new and novel drop-down fill spout for a bag filling machine has been provided which allows a plurality of articles to be filled in a rapid sequence into the bag in a manner heretofore unobtainable with prior art filling machines. The novel configuration of the filling spout, in the shape of a pair of pivotable overlapping clamshells, minimizes spillage and reduces unpleasant dust that normally occurs during a filling operation especially when filling the bags with charcoal or the like. The device of the invention and the method of the invention allows the filling of much larger size bags with bulkier and heavier objects without having to drop the filled bag a great distance to the base of the filling machine as has been the practice in previous type filling machines. The device utilizes the added weight of the filled product to aid in holding the bag on the filling spout until the filling is complete. As a result, the ultimate reforming of the gussets of the bag by the next step in the filling machine is accomplished in a much easier manner since the jarring of the bag, caused by its dropping, is minimized and the displacement of the bag on the datum base of the filling machine is also minimized. As a result, jam-ups at the gusset reformer are also minimized thereby minimizing downtime caused by such jamups.

From the foregoing it can be seen that a new and novel drop-down fill spout and method have been provided which accomplish all of the objects and advantages of the invention. Nevertheless, it is apparent that many changes in details of construction or arrangement of the parts of the invention or in the steps of the method may be made without departing from the spirit and scope of the invention as expressed in the accompanying claims and the invention is not to be limited to the exact matters shown and described since only the preferred embodiments have been given by way of illustration only.

Having described the invention, I claim:

1. A method for machine filling a bag from a pivotable clamshell type filling spout with gripping means associated therewith below a filling bin, the machine having a frame and a base formed on the frame, comprising the steps of:

- a. opening the upper portion of the bag after the bag has been positioned beneath the filling spout and at a predetermined position above the base;
 - b. lowering the pivotable clamshells into the pre-opened bag to a predetermined position within the bag while lowering the gripping means to a predetermined position on the outside of the bag;
 - c. pivoting the clamshells outwardly to a filling position within the bag while inwardly positioning the gripping means on the outer portion of the bag to firmly grip the bag between the plurality of clamshells and the gripping means, the pivoting clamshells and the inwardly positioned gripping means combining to provide a gripping force on the bag; and
 - d. filling the bag with objects from the filling bin while allowing the bag to lower as it is being filled below its original position, the lowering of the bag caused by the added weight of the objects in the bag causing an increase in the gripping force between the clamshells and the gripping means.
2. The method as defined in claim 1 further comprising the step of:
- e. retracting the gripping means while pivoting the clamshells to an inclined non-filling position thereby allowing the bag to drop a pre-determined distance to the base of the filling machine.
3. The method as defined in claim 2 further comprising the step of:
- f. raising the clamshells and the gripping means upwardly to a non-filling position.
4. A bag filling machine of the type for filling a bag with a plurality of objects and utilizing a filling structure comprising in part filling spouts with gripping means on the upper portion of the bag to retain the upper portion open during filling, comprising:
- a. a frame, having a base formed thereon;
 - b. means, associated with said frame, for opening the upper portion of the bag after the bag has been positioned underneath the filling spouts and at a predetermined distance above the base;
 - c. means, associated with said frame, for lowering the filling spouts into the opened bag and for lowering the gripping means on the outside of the opened bag; and
 - d. means, associated with said frame, for positioning the filling spouts outwardly to a filling position within the bag while positioning the gripping means inwardly to a gripping position against the bag and the filling spouts;
 1. said positioning means in combination with the filling spouts and the gripping means also serving to apply an increasing gripping pressure to the upper portion of the bag as the bag is filled with the objects and settles within the pre-determined distance to firmly grasp the bag between the gripping means and the filling spouts.
5. The bag filling machine as defined in claim 4 further comprising:
- e. means, associated with said frame, for releasing the gripped bag by positioning the filling spouts inwardly to a non-filling position and while positioning the gripping means outwardly to a non-gripping position.
6. The bag filling machine as defined in claim 5 further comprising:

- f. means, associated with said frame, for raising the filling spouts and the gripping means above and out of proximity to the upper portion of the bag.
7. The bag filling machine as defined in claim 4 wherein said opening means comprises in part a plurality of suction cups.
8. The bag filling machine as defined in claim 4 wherein the pre-determined distance ranges from approximately one-half inch to 1 inch.
9. The bag filling machine as defined in claim 4 wherein the filling spouts are formed as a pair of clamshells, each clamshell having a generally U-shaped configuration with overlapping ends.
10. In a bag filling device for a packaging machine of the type wherein a plurality of objects are filled into a bag from a storage bin having a lower transitional filling chute section, the improvement comprising:
- a. an open ended fixed sleeve section being formed on the lower portion of the transition chute;
 - b. a substantially vertical slideable sleeve section surrounding said fixed sleeve;
 - c. a plate member fixedly attached to said slideable sleeve;
 - d. a plurality of moveable and pivotable clamshells carried by said plate member and surrounding the lower portion of said slideable sleeve, said clamshells being moveable from an upward non-filling position to a downward non-filling position and then to an outward filling position;
 - e. a plurality of retractable gripping means, associated with said plate member, said gripping means being moveable from an upward non-gripping position to a downward non-gripping position and then to an inward gripping position; and
 - f. means, associated with the transition chute, the plate member, the slideable sleeve, the pivotable clamshells, and the retractable gripping means, for carrying and positioning the plate member, the clamshells, the slideable sleeve and the gripping means in such a manner that the slideable sleeve can be moved downwardly to a predetermined position, with the clamshells inside the bag and the gripping means outside the bag, after which the pivotable clamshells may be pivoted outwardly to their filling position and the retractable gripping means may be positioned inwardly to their gripping positions to exert a gripping force to retain the bag therebetween, a further downwardly movement of the plate member caused by a lowering of the bag as it is filled serving to increase the gripping force on the bag.
11. The improvement as defined in claim 10 wherein said carrying and positioning means comprises in part at least one positioning cylinder fixedly attached at its upper end to the transition chute and fixedly attached at its lower end to the plate member for vertical movement of the frame in proximity and out of proximity to the bag.
12. The improvement as defined in claim 11 wherein said carrying and positioning means further comprises in part a plurality of elongated rods pivotably mounted to said clamshells at one end thereof and slideably mounted at the other end thereof to the transition chute, said rods being spring biased so that an upward motion of the plate member serves to pivot the clamshells to an upward non-filling position whereas a downward motion of the plate member serves to move

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the clamshells downwardly first to a downward non-filling position, a further downward motion of the plate member serving to pivot the clamshells to an outward filling position.

13. The improvement as defined in claim 12 wherein said carrying and positioning means further comprises in part a plurality of inclined rods which are pivotably mounted at their upper ends to the clamshells and are pivotably mounted at their lower ends to the retracting gripping means, said spring biased elongated rods and said gripping means being interrelated in such a manner that a predetermined downward motion of the plate

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member releases the spring bias allowing the clamshells to assume their filling position whereupon a further downward motion of the spring biased elongated rods causes the retractable gripping means to move inwardly to exert a gripping force and to clamp the bag between the gripping means and the clamshells, a still further downward motion of the plate member caused by a lowering of the bag as it is filled causing a further gripping force to be exerted between the gripping means and the clamshells.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,830,266 Dated August 20, 1974

Inventor(s) Doyle R. Hudson

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

In the Abstract line 11, after "so that" insert -- as --.

Column 1, line 10, delete "Background of the Invention".

Column 1, line 18, insert -- Background of the Invention --.

Column 1, line 59, change "with" to -- within --.

Signed and sealed this 3rd day of December 1974.

(SEAL)

Attest:

McCOY M. GIBSON JR.
Attesting Officer

C. MARSHALL DANN
Commissioner of Patents

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