

May 19, 1970

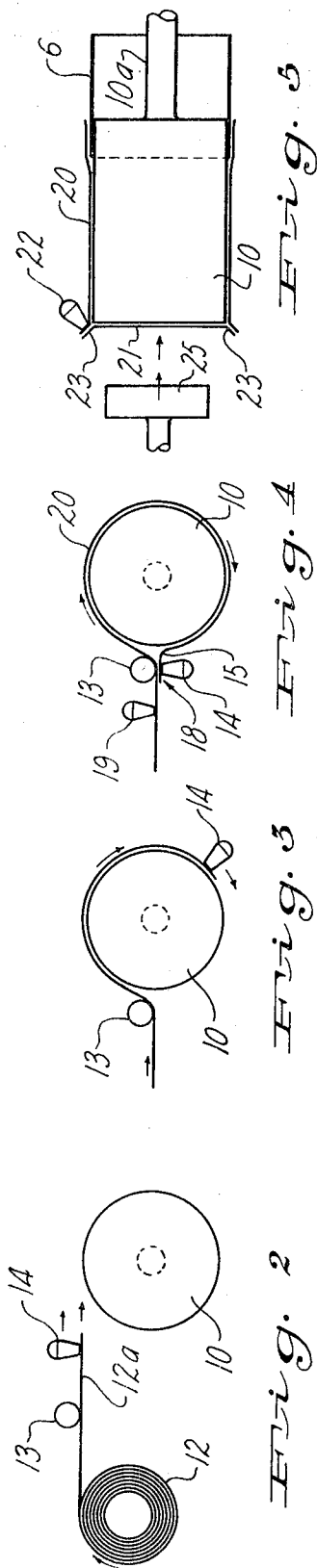
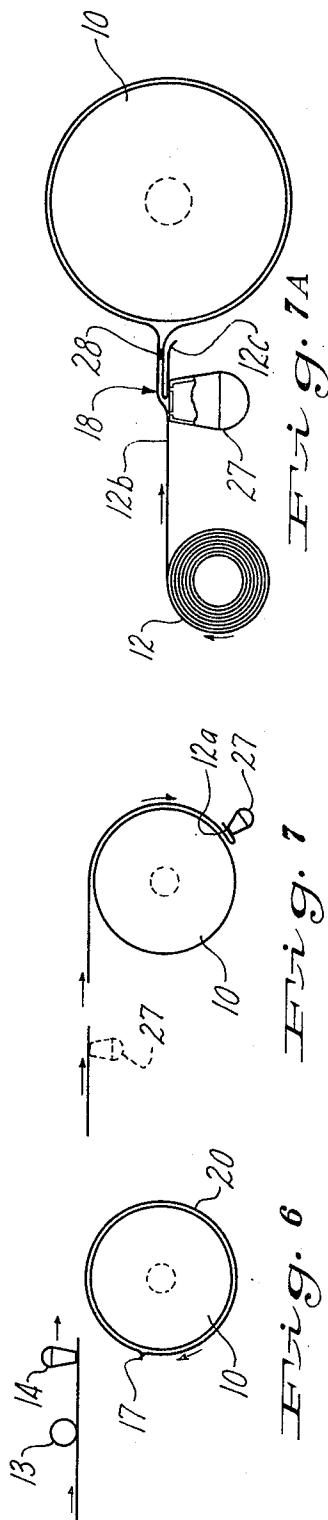
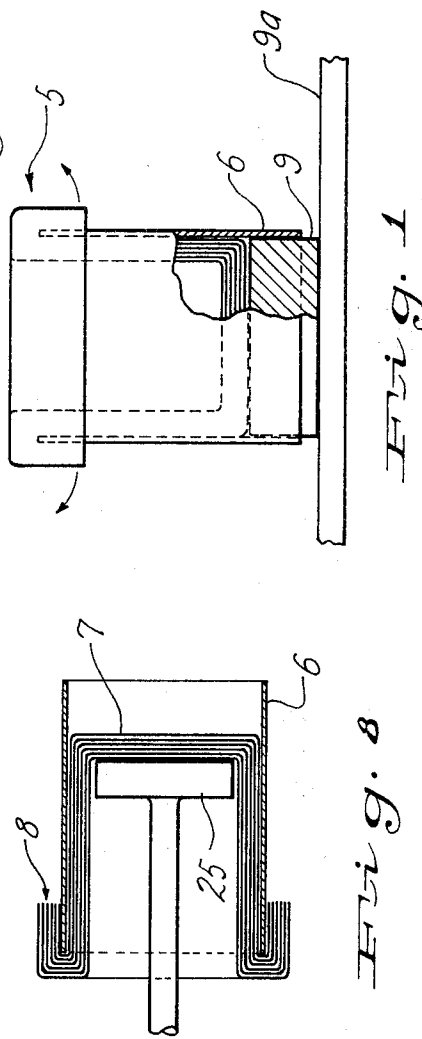
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3,512,338

PACKAGING WITH PLASTIC BAGS

Filed Dec. 10, 1965

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

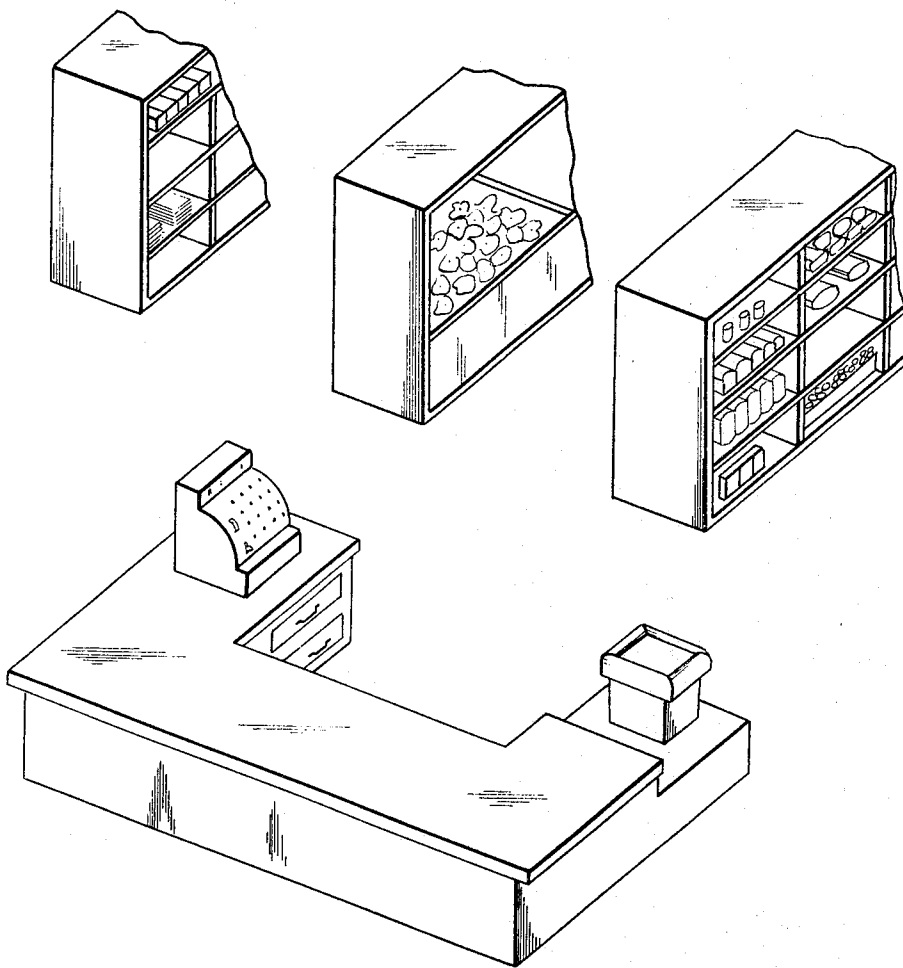


Fig. 9

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3,512,338

PACKAGING WITH PLASTIC BAGS

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1 Claim

ABSTRACT OF THE DISCLOSURE

This is a system and process for packaging comprising nested flexible bags of the polyethylene type supported in an open configuration and cuffed over a supporting piece at the top thereof. Articles are inserted in the innermost bag and then it is removed from the nest leaving more bags. The bags are located at a supermarket checkout station adjacent the grocery lobby area which, in turn, is preferably to the left of and adjacent to the cash register so that groceries may be picked up from the lobby area by the cashier, "rung up" on the cash register and then deposited in the open nest of bags without further handling. These bags in nested configuration are preferably produced by involution so that each successive bag is larger than the preceding bag.

My invention relates to merchandise packaging systems and more particularly to a system for packaging groceries at a grocery store check-out counter.

In accordance with the prior art of which I am aware, grocery stores have been using a system of bagging groceries at the check-out counters by the use of paper bags which has remained substantially unchanged for nearly sixty years. This system is inefficient, time consuming, and expensive. A clerk must usually reach under the counter for a paper bag, open the bag (usually by a quick motion of the arm causing air to catch in the bag and distend it), set the bag upright on the counter, frequently repeat the process and insert a second bag inside the first bag to give additional strength, place the groceries in the bags, one at a time, and slide the filled bags across the counter so that the customer can put her arm around the bag and carry it out like she was carrying a baby. While virtually everybody in the country is familiar with the shortcomings of this system, nevertheless, the system has remained unchanged and substantially unvaried. In a typical busy supermarket, two clerks are usually required at each counter, one to operate the cash register, and another to open the paper bags and pack the groceries therein. For customers who do not wish to chance having the bottom of a heavily-laden paper bag separate because of moisture absorption, bulky cardboard boxes are provided, thus increasing the amount of required storage space adjacent the check-out counter and increasing still further the number of steps involved in packaging.

The broad concept of packaging items in plastic bags is acknowledged as being generally old in the art, but the use of plastic bags for packaging groceries at a check-out counter has heretofore been considered impractical, probably because the plastic film which can be produced inexpensively for packaging purposes lacks the semi-rigid property that is familiar in paper stock. Although semi-rigid plastic film materials such as vinyl are commonly available, the cost of such material is far beyond the relative cost of paper packaging material.

Many attempts have been made to overcome the difficulty encountered in using inexpensive polyethylene plastic bags for grocery packaging. Devices have been introduced which inflate such bags with air so as to attempt to overcome the tendency of a plastic bag to remain flat with its sides adhering to each other. Various types of bag

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dispensing devices have also been proposed, based on the idea that the time lost in opening and filling the bags could be compensated for by making the bags more readily available at a position close to the point where they will be utilized. One such dispenser is described in U.S. 2,622,953 to Skillman, et al., which is adapted to hold a plurality of nested bags, in loosely stacked relationship, in a substantially horizontally disposed receptacle and has an intricate mechanism including feed bar, carriage, stop member, rib, weight, stopping means and hook-shaped member, interconnected and interacting so as to permit the dispensing of the bags. In U.S. 3,128,904, to Reilly, a plurality of nested bags are also used, not for packaging, but as anchored disposable liners for waste or trash in a container that has holddown hooks to accommodate eyelets of the liners. These and other methods have thus far failed to overcome the inherent problems associated with substituting inexpensive bags of plastic film for the familiar paper bags.

It is therefore an object of my invention to provide a new and improved system for quick, efficient and inexpensive packaging of groceries at a check-out counter.

It is a still further object of my invention to provide improved apparatus and processes for the manufacture of plastic bags.

In accordance with my invention I provide a plurality of plastic bags nested together in an upright open condition, with their open ends collectively turned outward and folded back around the body of the sides of the nested bags. Preferably the sides of the bags are supported by a hollow cylindrical cardboard drum or frame which encircles the main body of the nested bag and lies between a substantial portion of the sides of the bags and the turned back ends of the bags. The cardboard frame is preferably anchored by friction to a substantially circular mounting block which, in holding the frame thereon, also tends to hold the remaining bags in position while one bag is being pulled away from the nested arrangement.

In one embodiment of the invention, I have formed the cardboard frame into the shape of a cone frustum so that the frame sides taper and the narrower cone end is extended upwardly. I have found that a slight 10° tapering of the side of the frame tends in some instances to enable more efficient individual bag removal, depending on the thickness of film utilized, the number of bags per unit, and the length of the folded-back bag side portions.

The bags thus arranged in the aforementioned configuration are placed on the block or similar support device at the check-out counter of the grocery store, and the check-out cashier, as she tabulates the groceries purchased, moves each item with her hand to control her counting operation. As the cashier moves each successive item, she merely sets it in the depressed center of the multiple bag arrangement. When she is through with the transaction and has received payment for the groceries, she then loosens the edges of the top or inside plastic bag along the exterior surface of the multiple bag arrangement. She quickly slips the outer edge of the bag off the multiple bag form and pulls the sides of the bag up over the groceries. The bag is now ready to be carried off by the customer.

In accordance with one preferred embodiment of my invention, the plastic bags are constructed or manufactured by a process of involution with a continuous plastic film strip so that each successive bag is formed over a preceding bag and is slightly larger than such preceding bag so that a plurality of bags so formed are neatly and evenly nested together.

The invention will be best understood from the following detailed description when read in connection with the accompanying drawings in which:

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FIG. 1 is a sectional elevational view of a stacked unit of nested bags in accordance with my invention;

FIGS. 2 through 7A are schematic views to illustrate the process of manufacturing a multiple bag unit from a roll or planar strip of plastic film;

FIG. 8 is a cross-sectional view of the nest of bags being inserted into the tubular frame;

FIG. 9 is a schematic view of a merchandise area.

In accordance with my invention as shown in FIG. 1, I provide a unit or stack of bags 5 positioned one inside the other, preferably comprising several hundred plastic bags. As seen in FIG. 1, the effective volume of any particular nested bag is decreased an amount proportional to the volume assumed by any nested bag or bags in the unit that are positioned inside that particular bag. In one preferred embodiment of my invention, the bags are each approximately 23 inches high and 14 inches in diameter and are positioned in an open circumferentially distended manner and are surrounded by a hollow cylinder 6 formed from cardboard or similar semi-rigid material. The open ends of the bags 5 are collectively turned outward and downward over the outside surface of the cardboard tubular frame 6 for a distance of at least 2 inches. I have found that good results are obtained when the bags 5 are turned down on the outside of the cardboard frame 6 not more than one-third of their length. I have further determined that where it is desired to present to the user a depth less than two-thirds of the length of the bags 6, it is practical to compress the collective bottoms 7 of the bags in an accordion-like manner toward the grocery insert end or upper end 8 of the stacked bag arrangement. Such compression can be accomplished, for example, by having a mounting block of a height greater than the block 9 shown in FIG. 1 so that it will tend to push the bottoms 7 of the bags upwardly when the multiple bag unit 5 is positioned thereon, and such compression does not cause any substantial interference with removal or separation of the bags.

While I have found that polyethylene bags of a thickness of one mil may be used in this invention, nevertheless, plastic of this thickness is not the most practical. I have found that the customer's feeling of security has a large effect on his initial acceptance of the new type of system. For example, even though the bags may be sufficiently strong to hold the groceries, nevertheless, there is sufficient flexibility and stretchability inherent in the plastic film that when the customer picks up a bag of polyethylene of minimal thickness that has been loaded with groceries, he will have the sensation that the bag may break as he lifts and carries it away. A thicker bag is not only more acceptable to the customer but its resistance to initial tearing is substantially increased and it lends itself to successive reuse for various purposes in the home of the customer. On the other hand, if the plastic is too thick, it may be inflexible to the point of being impractical for use in the system. I have therefore determined that the most desirable thickness of plastic film to be utilized in my invention is that having a thickness range of 1.5 to 3 mils.

The preferred embodiment of my invention wherein each bag is slightly larger in size than the preceding bag in the stack may be accomplished by the process of manufacturing the bags in an open position over a mandrel 10 (FIGS. 2 through 7A) and successively constructing each succeeding bag around and over a preceding bag. This system has a number of advantages: a larger number of bags can be fitted together in a nested or telescopic manner without the necessity of folding the inner bags into a restricted space as would be required if the bags were all of equal size; the involution method produces a practical means of manufacturing conveniently shaped round bottom bags; and the involution process produces bags in a pre-nested arrangement so that the manual steps of opening each bag successively and inserting it inside of a preceding

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bag, or, alternatively, fitting a bag around the outside of a preceding bag is obviated.

The process of manufacture of the bags will best be understood with reference first to FIG. 2, which shows schematically a rotatable drum or mandrel 10 on which bags are to be formed successively, one upon another. In the process of making the first bag on the mandrel 10, and end 12a of a sheet of plastic film is drawn from a stationarily positioned rotatable sheet film roll 12. The end 12a of the sheet roll 12 is led beneath an idler roller 13 and then around the drum or mandrel 10. A suction bar 14 may be the means of drawing the sheet end 12a around the mandrel 10. As the sheet end 12a is drawn around the outer surface of the mandrel 10 by means of the suction bar 14, the roller 13 may be moved downwardly (FIG. 3) as it rotates, allowing the plastic sheet to move across the roller surface and onto the mandrel 10.

The formation of the tubular portion 20 of the first bag is completed when the suction bar 14 has led the end 12a of the plastic sheet entirely around the mandrel 10 so that the end 12a comes in contact with the bight 15 of the plastic sheet at a point beneath the roller 13 as shown in FIG. 4. It is at this stage of the operation that a side seam 17 is formed to complete the formation of the tubular portion 20 of the bag, such seam 17 being longitudinal to the bag and transverse to the remaining plastic sheet. The movable suction means 14 may also be provided with integral means for heat sealing the plastic film to fuse or weld the longitudinal seal 17 along the side of the tubular bag portion 20. Following the seam fusing operation, the plastic sheet is cut or sheared along a line adjacent and parallel to the seam 17 at a point 18. As the shearing operation commences, a second movable suction means 19 (see FIG. 4) may be moved into position to attach to the upper surface of the sheet end so that formation of a second bag is ready to begin, as shown in FIG. 6.

Prior to beginning the formation of the second bag, which will be formed to enclose the first bag, a bottom panel 21 of plastic (FIG. 5) is moved into position against the face end of the mandrel 10 so that the peripheral edge of the circular panel 21 may be aligned with the extended circumferential edge of the bag portion 20 to form a circular circumferential seam 23. FIG. 5 illustrates one manner which may be utilized to attach a bottom to each tubular bag portion 20 to complete the formation of a single bag. To seal the seam 23, the mandrel 10 may be rotated on its axis to move the circular seam 23 past a heating means 22, and the means (not shown) for holding the panel 21 in the proper position may also be a back-up plate to guide the rotating seam past the heating means 22. It is anticipated that the heating means 22 may be applied to either side of the outward extending seam 23 and that such heating means could be in a variety of structural forms. (Shapes utilized in FIGS. 2 through 7 are essentially symbolic representations, no structural limitations being expressed or intended.) It may also be found desirable in the mass production of bags to have a sealing means 22 to fuse the seam 23, with such sealing means moving in a circular path while the mandrel 10 remains stationary.

FIG. 5 also illustrates the preferred positioning of the cardboard supportive frame 6 (one half of which is shown cut away) from which the plurality of bags formed thereon will be later individually dispensed. A portion of the hollow cylindrical frame 6 is positioned to overlap the surface of the mandrel 10 so that the bag 20 and successive bags to be formed thereon overlap a portion of the frame 6. When the desired plurality of bags has been formed thereon, the mandrel 10 will be slidably removed in the direction of the mandrel support arm 10a, and a movable means such as a piston like plunger 25 may be moved in against the collective bag bottoms to deform the bags to a partially inside-out position within the cardboard frame 6, as shown in FIG. 8.

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As shown in FIG. 6, it may be desirable to rotate the mandrel 10 slightly to move the last formed seam 17 away from alignment with the next seam yet to be formed as part of the next successive bag. It may also be found desirable in the bag formation process as just described to rotatably drive the mandrel 10 as the plastic sheet is being led therearound by the suction means 14, although such rotation is not considered essential to the completion of the process.

The means of shearing the sheet after completion of the formation of each tubular portion of the bags and the means of sealing the seams may be embodied in the suction bar 14 itself, or alternatively, such means may be separate components that are moved into and out of position as needed. It may also be found desirable to dispense with the roller 13 or to utilize additional rollers and apparatus to improve the efficiency of the process.

Manufacturing the "stacked bag unit" is also possible without the use of a plurality of suction bars such as 14 and 19 indicated in FIG. 4. FIG. 7 illustrates the use of alternate means to lead the end 12a of the plastic sheet around the mandrel 10. A suction means 27 is shown attached to the underside of the sheet end 12a as indicated by the dotted line symbol in FIG. 7. As the suction means 27 begins its revolution around the mandrel 10 it would be rotated counterclockwise during such revolution so that the end 12a would be folded back upon itself. Thus, as shown in enlarged FIG. 7A (which is enlarged for clarity), after the formation of a weld 28 to complete the construction of a bag of portion 20, the plastic sheet would be cut transversely along a cut line between point 18 and weld 28, and a newly formed sheet end 12b would be grasped by the suction means 27. The suction means 27 would then be in a proper position relative to the plastic sheet being dispensed from the roll 12 to continue its revolution around the mandrel 10 for the formation of the next bag portion. This manner of completing the formation of a bag portion 20, although it would produce a waste strip of plastic sheet 12c, may be found more desirable in terms of efficiency so as to justify its inclusion in structure employed for the bag making process.

Having thus described new apparatus for packaging with plastic bags, and a unique method for the construction of such apparatus, what I claim is:

1. In a packaging station having a merchandise packaging area including a register, a merchandise area adjacent said register for holding articles waiting to be checked by an operator and a system for the rapid packaging of successive lots of one or more articles comprising:

(a) a plurality of compactly nested, substantially fully open, flexible thermoplastic bags with said plurality

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of bags nested into one another for packaging merchandise wherein the sides of the bags are collectively folded outwardly and backwardly over their length to form a cuff of less than one-third of the total of the bags, in such manner so as to unrestrictedly remove successive bags with the edge of each cuff of said plurality of bags exposed and the effective volume of any particular bag decreased an amount proportional to the volume assumed by any said bags positioned inside said particular bag; and (b) supporting means for laterally and vertically supporting said plurality of nested thermoplastic bags, said means including a generally upstanding portion supportingly engaging said plurality of bags inside said cuff and a generally horizontal portion centrally supporting said plurality of bags to allow unrestricted removal of the outermost cuff and the corresponding innermost bag.

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