United States Patent

Dohmeier et al.

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[54] PACKAGING DEVICE

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[51] **Int. Cl.** **B65b 43/12,** B65b 67/04, B65b 7/02

[58] **Field of Search** 53/187, 188, 189, 373, 390, 53/391

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[57] **ABSTRACT**

A device for packaging goods, such as in a supermarket and the like, is arranged to pack the goods in a flexible bag-like member held in an open position at a loading station and, after the loading operation is completed, the bag-like member is sealed and delivered to a pick-up station in an automatically performed operation. Belts convey the bag-like members individually to the loading station where the members are opened for carrying out the packing operation. Other belts convey the packed bag from the loading station to the pick-up station and at a point between the loading station and the pick-up station the mouth of the bag is sealed. A belt conveyor can be used to support the packed bag-like member from the loading station to the pick-up station. The bag-like members are withdrawn from a supply roll containing a continuous strip of interconnected bag-like members which have a reinforced mouth and the bag-like members are formed from a folded over longitudinally extending strip of flexible film material welded together at spaced positions to form the individual bag-like member.

9 Claims, 4 Drawing Figures

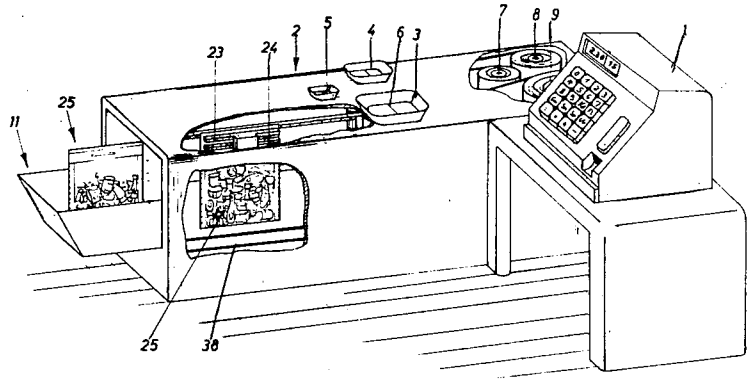
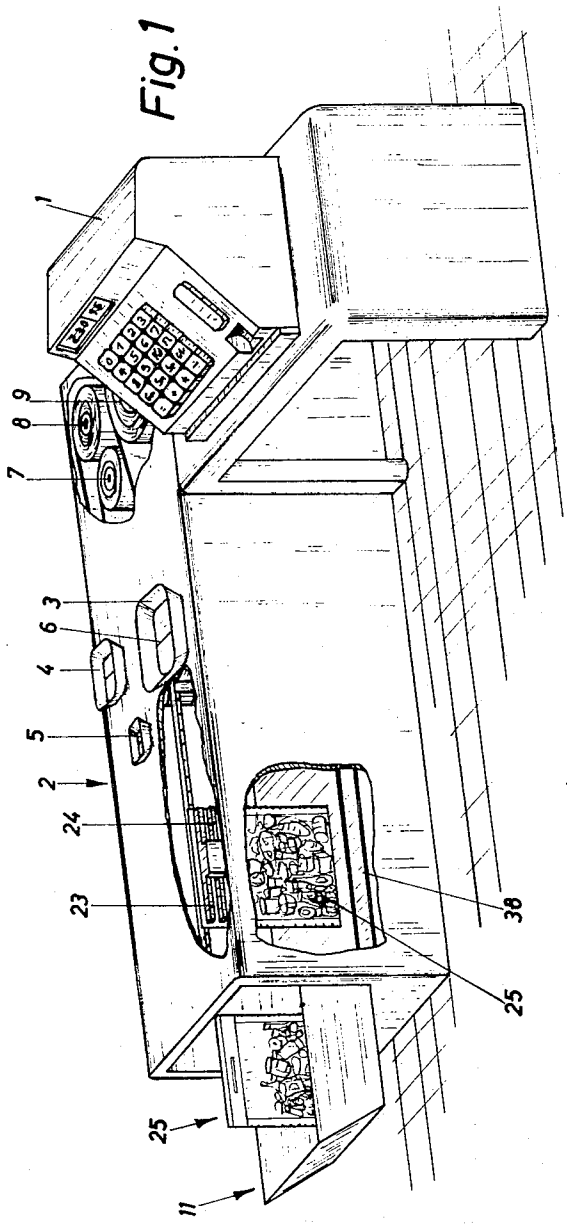


Fig. 1



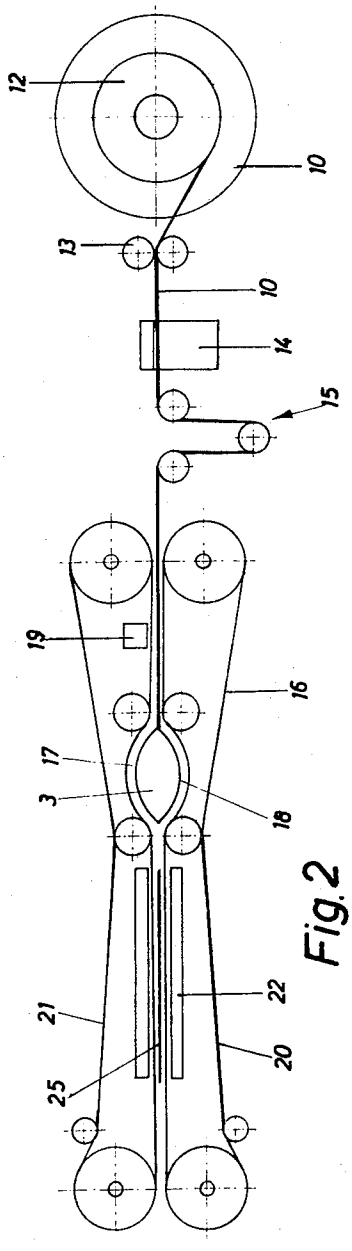


Fig. 2

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Fig. 4

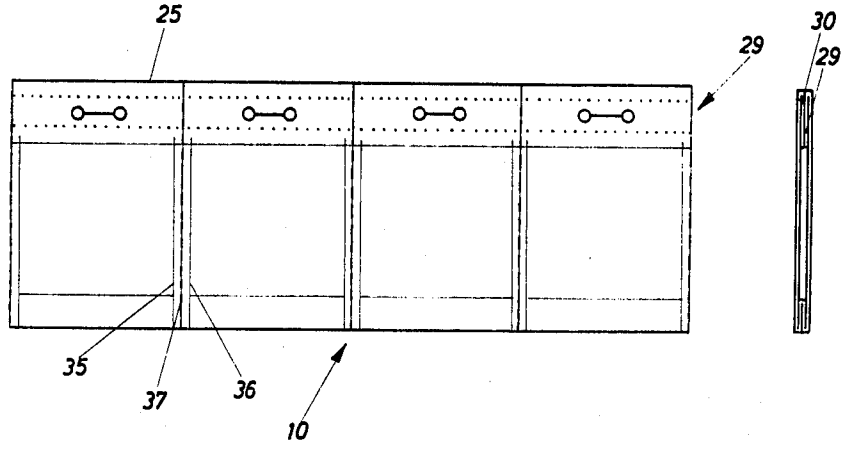
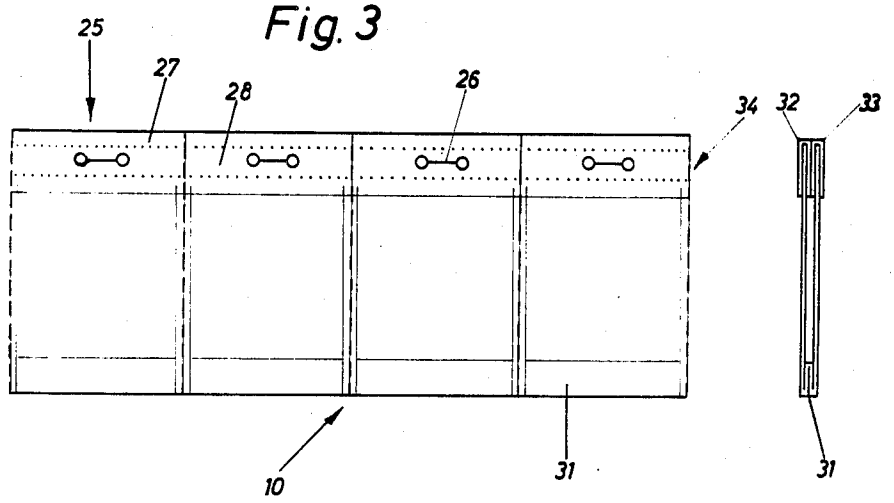


Fig. 3



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PACKAGING DEVICE

SUMMARY OF THE INVENTION

The present invention is directed to an automatic packaging device for stores, such as supermarkets and the like, and more particularly it is directed to a device for positioning individual bag-like members removed from a strip of interconnected members, which are located at a loading station in an opened condition for receiving the goods and, after the goods are packed, the individual bag-like member is removed from the loading station, the open end of the bag-like member is sealed and it is delivered to a pick-up station, such as at the end of a check-out counter in a supermarket. Further, the invention is concerned with the formation of the bag-like members formed in a continuous interconnected strip from a longitudinally extending folded over strip of a flexible film material. The strip of flexible film material is welded perpendicularly to the fold line at spaced positions for forming the individual bag-like members and lines of a weakness or perforations are formed between the bag-like members so that they can be easily separated.

In large retail stores, especially in self-service stores such as supermarkets, it is customary to provide a checkout counter at which the cost of the goods is tabulated and the goods are packed into bags. Such check-out counters usually consist of a cash register with a seat for the person operating the cash register and a counter surface on which the customer places the goods he has selected. The counter surface is frequently combined with a horizontally arranged conveyor belt which can be adjusted into three or more different positions with receiving containers located at the opposite ends of the different positions of the conveyor belt from the counter surface.

In such as arrangement, the checker or person operating the cash register takes the goods from the counter surface, enters the price of the goods into the cash register, and then places the goods on the conveyor belt so that they are collected at the end of the conveyor belt in the receiving container. After the customer has paid for the goods, he can take the goods from the receiving container and place them into his own shopping bag or into bags provided at the checkout counter for packaging the purchased goods. After each customer is checked out, the conveyor belt is shifted horizontally so that the goods of the next customer are delivered into a different receiving container at the end of the conveyor belt.

It has been found that even though three receiving containers are arranged side-by-side, and the conveyor belt is adjustable horizontally to fill the three containers, the time required for packing the goods takes so long that the checking out operation is delayed and interrupts the smooth flow of customers from the store. Particularly where a large number of items are purchased, it is readily understandable that the packing, whether effected by the customer or a store employee, requires more time than tabulating the purchases of the next two customers at the check-out counter.

The primary object of the invention is to avoid this bottleneck which develops at the check-out counters in retail stores, particularly in supermarkets, and to provide an automatic packaging device to speed the checking-out operation and to eliminate the delays, mentioned above, whether the goods purchased are packaged manually by the customer or by a store employee.

The problem solved by the invention involves the use of a packaging device in which holding and feeding means are composed of two separate belt groups which can be driven independently of one another. The first belt group delivers the bag-like members to a loading station at which the mouth of the bag-like member is opened to receive the goods purchased and the second belt group extends from the loading station to a pick-up station for removing the packed bag-like member from the loading station and delivering it, in a sealed condition, to the pick-up station. Such a packaging device can be incorporated into the check-out counter so that the goods, after their price is tabulated, are packed automatically into the bag-like member. This packaging device, in accordance with the present invention, makes it possible for the checker to take the goods from the customer's shopping basket or from the counter surface provided for that purpose and, after tabulating the price of the goods, to position the goods so that they can be packed directly into a bag-like member and when all of the goods have been tabulated, the bag-like member can be automatically sealed and delivered to the pick-up station at the end of the check-out counter ready to be carried away by the customer. While the goods are being automatically packaged and delivered to the pick-up station, the customer can pay for them and, while the customer is picking up his goods, the checker can proceed to the next customer and start checking out the items he has purchased and placing them at the proper location for the packaging operation. In this way, no problem develops with the goods of successive customers becoming mixed at the pick-up end of the check-out counter. After a customer has paid he can pick up the sealed bag-like member or members and carry them from the store without requiring any further packaging operation.

In the German Auslege schrift Pat. No. 1,225,537, a fully automatic apparatus is disclosed for the continuous packing of coarse bulk goods. In such equipment, a strip of flexible film material, such as a continuous sheet of a plastic film is fed into a specially designed machine for forming interconnected bag elements and the bulk goods, such as potatoes, are continuously packed into the individual bag elements from a storage hopper. Though this packaging arrangement has been on the market since 1965 and is widely used in potato packing plants, neither the bag-like members nor the packaging equipment used would indicate a solution to the problem to which the present invention is directed because of the different characteristics between the bulk loading operation of the prior art and the selective loading and packaging operation of the present invention.

To date the attempts to solve the problem to which the present invention is directed have extended in a different direction from that taken by the present invention, that is, to increase the number of containers positioned at the pick-up end of the adjustable conveyor belt used at the check-out counter. However, this answer to the problem has the disadvantage that it requires considerable space with the resultant limitation in the number of available check-out counters. Apart from the advantages achieved by the present invention, in eliminating delays at check-out counters, the invention also has advantages of a security nature. Since, after the checker operating the check-out counter has entered the price of the goods into the cash register and the bag-like member is automatically sealed, it is not possible to place any additional goods into the bag-like member. As a result, the customer leaves the store with sealed bags which afford a positive protection against shoplifting because any goods carried out by the customer which originated in the store and are not contained within the sealed bags must have been stolen. The packaging device is incorporated into the check-out counter and the opening in the counter surface through which the goods are charged into the bag-like members can be arranged so that only the checker can place the goods in position to be filled into the bag-like member located at the loading station. The characteristic of the packaging device provides another security feature which prevents goods from being removed from the store without being paid for.

Another feature of the invention is the incorporation of the control of the packaging device with the circuit of the cash register so that, after the total of the goods purchased has been entered, the opening in the counter surface to the loading station is closed and the conveyor means of the packaging device is set in motion for delivering the packed and sealed bag to the pick-up station.

To prevent the possibility of a delay during store rush hours due to the replacement of a roll of bag-like members, the present invention also involves the provision of extra supply rolls of the bag-like members within the check-out counter in

such a way that a replacement roll can be effected automatically when another roll has been completed.

The present invention also contemplates the use of a plurality of packaging lines each supplied with a separate roll of bag-like members so that each roll has bag-like members of a different size. In such an arrangement, large bag-like members made of a relatively strong material can be provided for large or heavy items, such as bottles, cans and the like and smaller bag-like members of lower strength material can be provided for packaging small items so that waste of the film like material used in forming the bag-like members is kept to a minimum. Where different packaging lines are provided at the check-out counter, different charging openings are also provided each operated by its own control button.

Preferably, the openings in the counter surface at the loading stations are closed by a scanning flap which is incorporated into the circuit of the packaging device so that when it is opened, the device comes operative. By actuating an additional key or button on the cash register or other control panel, the flap can be closed again and the device is ready for the next packaging operation.

In the path of the bag-like member, as it is conveyed from the loading station to the pick-up station, is a welding device for sealing the open end of the bag-like member. In a preferred embodiment of the invention, the welding device effects a double weld of the open end along lines extending in the path of direction of travel of the member so that a pair of welds are provided, one on each side of a carrying handle formed in the bag, so that the carrying capacity of the bag is substantially increased.

At the pick-up station end of the check-out counter, the packed and sealed bag-like members can be picked up by the customer without further processing. Preferably, a conveyor belt is arranged between the loading station and the pick-up station for supporting heavy bags as they are conveyed to the pick-up station.

The various features of novelty which characterize the invention are pointed out with particularity in the claims annexed to and forming a part of this specification. For a better understanding of the invention, its operating advantages and specific objects attained by its use, reference should be had to the accompanying drawings and descriptive matter in which there are illustrated and described preferred embodiments of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

In the Drawings:

FIG. 1 is a perspective view of a check-out counter incorporating a packaging device in accordance with the present invention;

FIG. 2 is a schematic top view of the packaging device illustrated in FIG. 1;

FIG. 3 is an elevational and sectional view of one embodiment of a continuous strip of bag-like members; and

FIG. 4 is an elevational and sectional view of another embodiment of a continuous strip of bag-like members.

DETAILED DESCRIPTION OF THE INVENTION

In FIG. 1, a check-out station is illustrated such as is typical in a supermarket and other similar retail establishments. A cash register 1 is positioned at one end of an elongated check-out counter 2. The counter 2 forms a casing or housing for a packaging device and its upper surface, adjacent the cash register, provides a counter surface on which the goods selected by a customer are placed preparatory to the checking-out operation. In the top of the counter 2, adjacent the surface on which the goods are arranged for the checking out operation, three charging openings 3, 4, and 5 are provided, each having a scanning flap 6 which opens when at item is placed on it. It will be readily understood that other scanning devices or closing means can be provided for the charging openings without departing from the spirit of the invention.

Within the counter 2 at its end adjacent the cash register, three supply rolls 7, 8 and 9 of flexible film material for forming the bag-like members are arranged. The supply rolls can be formed of continuous strips of interconnected bag-like members or the packaging device can include apparatus for folding a continuous strip of the film-like material, preferably formed of a continuous band of plastic material such as is commonly used in packaging operations, and converting the folded strip into a continuous strip of interconnected bag-like members sealed along the edges and open at the top so that material can be inserted into the members,

In FIG. 2, the manner in which the film-like material is removed from the supply rolls 7, 8 and 9, is shown with the material 10 being removed from the roll 12 and fed to one of the charging openings where the bag-like member is opened and subsequently conducted to a device for sealing the bag and delivering it to a pick-up container 11 at the opposite end of the counter 2 from the cash register 1. As shown in FIG. 2, the film material 10 is withdrawn from a supply roll 12 and is conducted through two guide rollers 13 to the guide plates 14. In the housing of the guide plates 14 photoelectric scanning apparatus can be provided for scanning the film material and controlling its intermittent feed.

After its passage through the guide plates 14, the film material is conducted over tension rollers 15 and arrives at the inlet of a pair of belts 16 and 17 which are arranged to hold and feed the bag-like members to the loading station. The belts 16 and 17 are of a V-belt construction and are conducted over guide and tension rollers so that the bag-like members can be moved into the loading station aligned below the opening 3 at which position the mouth or open end of the bag is spread apart by an opening device 18 in preparation for receiving the goods to be packaged. The belts 16 and 17 hold the bag-like member below the charging opening 3 so that the bag-like member is ready to be packed. Before the continuous strip of bags reaches the charging opening 3 a severing device 19 is actuated so that individual bags are presented at the loading station below the charging opening 3.

Adjacent the loading station, a second pair of belts 20, 21 extend over guide and tension rollers for receiving the filled bag and for transporting the bag to the container 11 which forms the pick-up station at the end of the counter. In FIG. 2, a bag-like member 25, is shown being conveyed from the loading station to the pick-up station and passing through a sealing device 22. As is illustrated in FIG. 1, the sealing device 22 is a welding apparatus formed of a pair of welding bars 23, 24 one located above the other for welding the bag-like member 25 in two separate lines across its previously open end. As can be seen in FIG. 3, a carrying handle 26 is provided in the bag-like member between the two weld lines and, in addition to providing a seal for the member, the welds also increase the carrying capacity of the bag-like member.

After the bag-like member 25 is sealed the belts convey it into the container 11 where the bag-like member 25, as represented in FIG. 1, is ready to be picked up by a customer. Additionally, as shown in FIG. 1, a conveyor belt 38 is positioned below the bag-like member 25 for supporting it as it is conveyed from the loading station below the charging opening 3 to the container 11. The operation of the two pairs of belts 16, 17 and 20, 21 is controlled so that when a filled and still open bag is taken by the second pair of belts 20, 21 an additional length of the film material is unwound from the feed roll 12 so that a single bag-like member 25 can be positioned in the open condition below the charging opening 3 for the next packaging operation. When the bag-like member is in place the first pair of belts 16 and 17 are stopped. However, the second pair of belts 20 and 21 are ready to receive a filled bag-like member from the loading station for sealing it and delivering it into the pick-up container 11. Only when the bag-like member is discharged into the container 11 is the drive of the belts 20, 21 stopped. However, it is possible to arrange the packaging device so that the belts 20, 21 are driven continuously and the first pair of belts 16 and 17 only work intermittently for positioning individual bags at the loading station.

The arrangement of the film material for us in the packaging device of the present invention is illustrated in FIGS. 3 and 4. In each Figure the film-like material **10**, which as mentioned previously is a plastic sheet material of the type commonly used in packaging operations, is folded over providing a longitudinal fold at the bottom of the bag so that bag can be opened and provide flat bottom construction so that the capacity of the bag-like member is increased. The opposite sides of the folded over strip of material are welded together at spaced locations along the length of the strip providing a pair of adjacent welds **35**, **36** which extend from the bottom fold toward but spaced from the free ends of the strips. A line of weakness or perforations is provided between the welds **35** and **36** from the bottom fold to the free edges of the strip to improve the ability of the interconnected bag-like members **25** to be separated into individual members for placement at the loading station. As mentioned above, the severing device **19** provides the separating action for dividing the interconnected bag-like members into individual members.

In FIG. 3, the free ends of the strip of film material **10** which form the open end of the bag-like members are provided with an additional folded over strip **32**, **33** of similar material for reinforcing the open ends. In FIG. 4, the free ends of the strip are folded over as shown by the flaps **29** and **30** to provide the reinforcement. The bag-like member as shown in FIG. 4 is of a simpler construction and would be used for smaller packages than the bag-like member illustrated in FIG. 3. In both FIGS. 3 and 4, the reinforced opened end of the bag is shown with dotted lines extending generally parallel to the bottom fold line and along these lines the weld bars **23**, **24** provide the sealing effect for the bag-like members after they have been filled. Between the lines **27** and **28**, the reinforced ends are cut to provide handle openings **26**. As mentioned above, when the bag is filled, and sealed the weld lines **27** and **28** not only seal the bag but also increase its carrying capacity when the handle **26** is used.

It will be appreciated that various materials can be used in forming the bag-like members as long as the materials satisfy the requirement of providing a sealed closure for the bag-like members after the packing operation has been completed.

We claim:

1. In apparatus for use in association with a web of packaging material which is longitudinally folded so that the folded edge forms a closed lower edge of a continuous web, with the web being open at its upper end and divided by welded seams extending at right angles between the upper and lower edges to form a plurality of bags connected to one another along weakened tear lines located between the welded seams, the apparatus including first belt conveyor means operable to engage and draw the web from a supply thereof to a loading station, spreader means at the loading station operable to open a bag, and means operable to sever the leading bag from the web; the improvement comprising, in combination, a retail store check-out counter enclosing said apparatus and having a counter top for receiving customer's articles to be packed in said bags; said counter having a storage space at one end for storing a supply of the packaging material; said counter top having at least one opening intermediate its ends vertically aligned with said loading station for packing of customer's articles from said counter top into a bag at said loading station; an externally accessible customer's pick-up station at the opposite end of said counter; and second belt conveyor means operable, independently of said first belt conveyor means, to engage a packed bag at the exit of said loading station and transport the packed bag to said customer's pick-up station.

2. A device for automatically packaging different goods purchased in a store, such as in a supermarket, in a sealed flexible bag-like member comprising wall means forming a casing and providing a counter surface as the top of said casing for receiving the goods to be packaged, said casing forming an open space below said counter surface, said counter surface having at least one opening therethrough communicating with the open space therein, first means located within the open space in said casing for moving individual flexible bag-like members from a storage station into a loading station and for holding the bag-like members in the loading station aligned below the opening in said counter surface, means for opening the mouth of the bag-like member at the loading station below the opening in said counter surface, and second means for removing individual ones of the bag-like members from the loading station after the completion of the loading operation and for delivering the bag-like member to a pick-up station, said second means including means for sealing the mouth of the filled bag-like member and said sealing means located intermediate the loading station and the pick-up station, said means for sealing the mouth of the filled bag-like member comprising a pair of welding members disposed in parallel relationship with one spaced above the other and extending in the direction of travel of the bag-like member from the loading station to the pick-up station, and said welding members arranged to receive the bag-like member for forming a pair of spaced welded seals across the mouth end of the bag-like member.

3. A device for automatically packaging different goods purchased in a store, such as in a supermarket, in a sealed flexible bag-like member comprising wall means forming a casing and providing a counter surface as the top of said casing for receiving the goods to be packaged, said casing forming an open space below said counter surface, said counter surface having at least one opening therethrough communicating with the open space therein, first means located within the open space in said casing for moving individual flexible bag-like members from a storage station into a loading station and for holding the bag-like members in the loading station aligned below the opening in said counter surface, means for opening the mouth of the bag-like member at the loading station below the opening in said counter surface, and second means for removing individual ones of the bag-like members from the loading station after the completion of the loading operation and for delivering the bag-like member to a pick-up station, said second means including means for sealing the mouth of the filled bag-like member and said sealing means located intermediate the loading station and the pick-up station, said first means comprising a pair of endless first belts and rollers for driving said belts, said rollers being arranged so that said belts are in juxtaposed relationship for a portion of their path of travel so that the bag-like members are gripped by said belts for moving the bag-like members into the loading station and for combining with said means for opening the mouth of the bag-like member for holding it in position to be loaded at the loading station.

4. A device, as set forth in claim 3, wherein said second means comprising a pair of endless second belts and rollers for driving each of said second belts, said rollers being arranged so that said second belts are disposed in juxtaposed relationship for a portion of their path of travel so that said second belts can withdraw the bag-like member from the loading station and convey the bag-like member through said sealing means and deliver it in the sealed condition to the pick-up station.

5. A device, as set forth in claim 4, wherein a conveyor is positioned below said second means and extending from the loading station to the pick-up station for supporting the bag-like members and for assisting in conveying the filled bag-like member to the pick-up station.

6. A device, as set forth in claim 3, wherein a supply roll is located within said casing and spaced from the loading station for holding a supply of interconnected bag-like members, and said first means including rollers for withdrawing the bag-like members in the interconnected condition from said supply roll and for delivering them to said first belts.

7. A device, as set forth in claim 6, wherein a continuous interconnected strip of bag-like members is wound on said supply roll, said strip of bag-like members comprising an elongated band of flexible film material folded along a longitudinal fold line providing a pair of opposite sides each having a free edge disposed in adjacent co-extending relationship with the

other, additional flexible film material disposed along and secured to the free edges of said elongated band for forming reinforced edge surfaces along the free edges, said reinforced surfaces along said free edges having an opening therethrough spaced from the free edge with the opening extending generally parallel to the fold line of said band so that the opening can be used as a handle, said fold line being arranged to provide an openable bottom for the bag-like member, the opposite sides of said folded band being welded together at longitudinally spaced positions to form individual interconnected bag-like members with the welded edge portions extending from the fold line to a position adjacent the reinforced free edges for permitting the bag-like members to be easily opened, and the welded edge portions of the interconnected bag-like members having lines of weakness extending from the fold line to the free edges thereof whereby the bag-like members can be separated from one another, and, after being separated and filled, each of the bag-like members is welded along a pair of spaced longitudinally extending lines adjacent the free edges thereof with said weld lines being located on the opposite sides of the handle opening through the reinforced edges.

8. The improvement claimed in claim 1, including sealing means engageable with the open end of each bag, during transport from said loading station to said pick-up station, to seal the open end of a packed bag.

9. The improvement claimed in claim 1, including selectively openable normally closed cover means for each opening in said counter top.

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