July 17, 1962 T. Y. ROSS 3,044,369

METHOD FOR MAKING BAGS

Original Filed Aug. 1, 1957 2 Sheets-Sheet 1

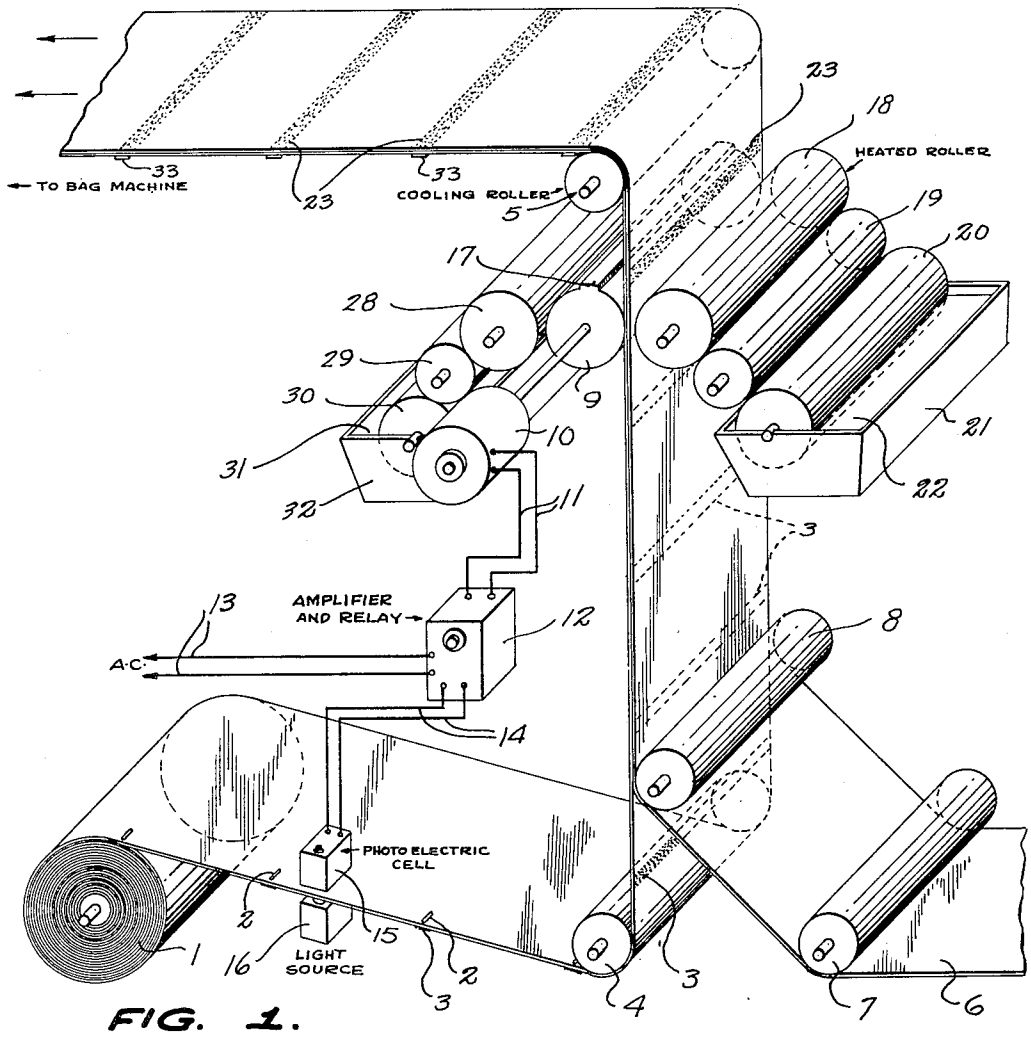


FIG. 1.

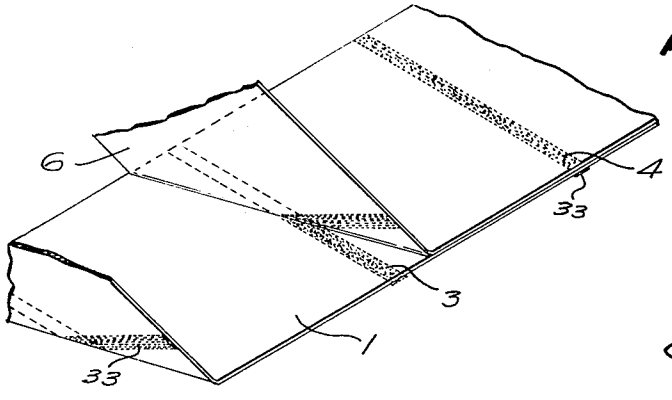


FIG. 2.

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Original Filed Aug. 1, 1957 2 Sheets-Sheet 2

FIG. 3.

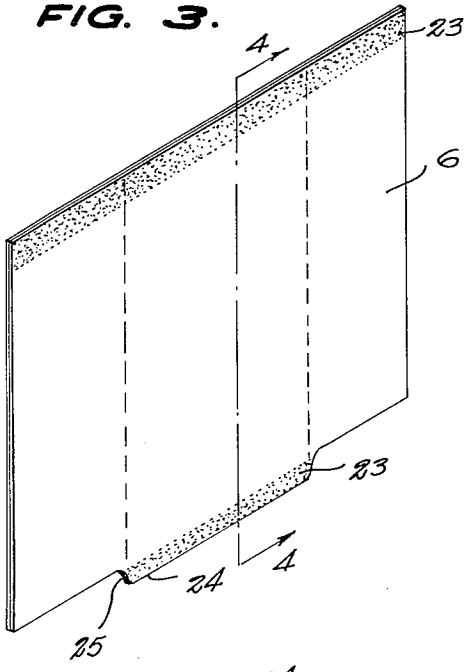


FIG. 5.

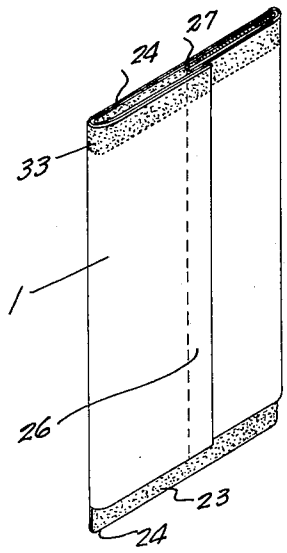
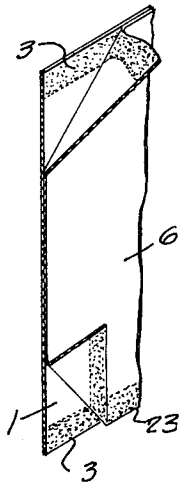


FIG. 4.



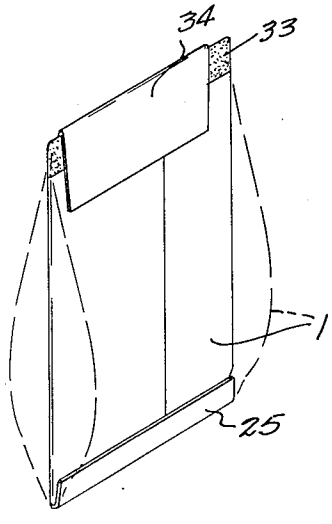


FIG. 7.

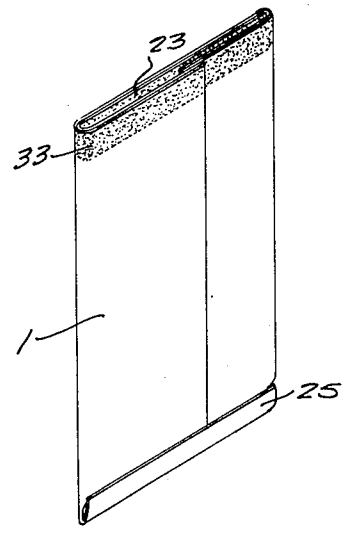


FIG. 6.

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3,044,369

METHOD FOR MAKING BAGS

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Original application Aug. 1, 1957, Ser. No. 675,747. Divided and this application Jan. 21, 1958, Ser. No. 710,311

1 Claim. (Cl. 93—35)

This application is a division of application, Serial No. 675,747 filed August 1, 1957.

The present invention is related to the art of producing multi-ply webbing of sheet material to be used in the manufacture of duplex bag blanks and bags made therefrom and more specifically is directed to methods and apparatus for producing multi-ply webbing of sheet material including sealing material thereon for forming duplex bags heat sealable at the top and bottom thereof as well as bag blanks and bags producible therefrom.

The principal object of the invention is to provide a webbing of flexible sheet material consisting of at least two superimposed webs of sheet material, connected at spaced intervals along the length of the webbing at portions thereof which will form the top and bottom of the bags to be made therefrom and including a coating of heat sealable material on at least one side of said webbing at portions thereof corresponding to the aforementioned points of connection between webs.

A further and important object of the invention is to provide a method and apparatus for forming a multiply webbing in a continuous and inexpensive manner from a plurality of plies of webbing including joining the single webs together at spaced intervals along their length which intervals are made to correspond with the lengths of bags to be produced from said webbing and simultaneously applying a coating laterally to at least one side of said multi-ply webbing at said spaced intervals which coating can by the application of heat and pressure, seal the ends of said bags.

Another and equally important object of the invention is to provide a bag having an inner liner and outer covering sheet which liner and covering sheet are joined by a heat seal adhesive at the top and bottom marginal edges thereof giving the bag a lateral rigidity which aids in the handling of the bags by automatic packaging machinery and also adds to the display valve of the bags when packed and which bag further has a coating of a heat sealable adhesive along the inner top marginal edge of said liner whereby the top of the bag can be quickly and easily sealed adding to the rigidity of the bag, eliminating the conventional fold-over of the bag end for closure purposes as well as unsightly paste lines at the top of the bag apparent on previously known bags.

Further objects of the present invention will be in part obvious and in part pointed out in the following detailed description of the drawings, in which:

FIG. 1 is a diagrammatic view of the apparatus for producing multi-ply webs of sheet material according to the present invention.

FIG. 2 is a perspective view of a section of the resulting multi-ply webbing with one ply thereof folded upwardly disclosing the inner faces of two plies.

FIG. 3 is a perspective view of the inner face of a bag blank made from the present webbing.

FIG. 4 is a cross sectional view taken on line 4—4 of FIG. 3 with the inner ply folded outwardly disclosing the adhesive connection between plies.

FIG. 5 is a perspective view of a tube formed from said bag blank being the initial step towards producing a bag therefrom.

FIG. 6 is a perspective view of the bag with unsealed open end; and

FIG. 7 is a view similar to FIG. 6, but with both ends of the bag sealed and a label or handle attached thereto.

Referring now more particularly to the accompanying drawings wherein like and corresponding parts are designated by similar reference characters, a continuous web of sheet material is indicated by the numeral 1 which material is of a width corresponding to the width of a bag blank to be produced therefrom having indicia 2 printed along the length thereof at given intervals preferably adjacent a marginal edge of the web. Said indicia can for example be spaced one from the other a distance representing the length of the paper bag blank with additional printed matter between each pair of indicia 2 across the webbing which printed matter could be the matter to appear on the outside of the finished bag, as the webbing 1 will form the cover to the resulting duplex bag producible therefrom. On the side of webbing 1 opposite to indicia 2, but corresponding therewith are provided a series of laterally extending bands of thermoplastic heat seal adhesive 3. The indicia 2 such as other additional printed matter as desired and the adhesive 3 are applied to the web 1 at the same time such as by printing whereby all three are in register, that is, given a definite position relative to one another and applied to the web prior to its introduction to the apparatus shown in FIG. 1 as a wound roll.

Web 1 is introduced around a roller 4 with the adhesive 3 on the opposite side to said roller and continued upwardly and around a cooling roller 5. Said roller 5 is cooled in any conventional manner such as by refrigeration, passing a coolent therethrough or the like for the purpose of cooling the webbing passing thereover.

A second continuous web 6 of sheet material which web is of substantially the same width as web 1 is fed around roller 7 and also around roller 8 which latter roller is positioned for guiding web 6 against web 1 whereupon the webbing are superimposed with adhesive 3 therebetween. Web 6 continues upwardly in line with web 1 and over roller 7 with said web but on top of the same.

A roller 9 is driven in rotation by an electric motor 10 connected by wiring 11 to a conventional amplifier and relay 12 which relay is connected by wiring 13 to a source of electrical current and also by separate wiring 14 to a photoelectric cell 15. A source of light 16 is positioned beneath web 1 in such a manner that the indicia 2 will be caused to pass thereover as web 1 is advanced. Similarly, the photoelectric cell 15 is mounted above the light source 16 and indicia 2 whereby as each indicia 2 passes therebeneath it will break the beam of light from 16 causing the photoelectric cell to vary the speed of the motor 10 by means of the amplifier and relay 12 and thus the rotation of roller 9.

Said roller 9 has a peripheral projection 17 extending longitudinally thereof which projection is of a width slightly larger than one band of adhesive 3.

A heated roller 18 which is heated in any conventional manner such as by heating elements therein or the passage of a heated liquid therethrough or the like is positioned diametrically opposite to roller 9 and on the opposite side of the webbing, that is, adjacent the outer side of web 6. Said roller 18 is further positioned in such a manner that upon projection 17 contacting web 1, web 6 will be pressed against roller 18 and both webbings pressed together.

Roller 18 is further in rolling contact with a roller 19 which in turn is in rolling contact with roller 20 partially extending within a vat 21 containing a molten batch of a thermoplastic heat sealing adhesive 22.

The particular adhesive contained in vat **21** is not specific to the present invention but for example applicant uses the term thermoplastic heat seal adhesive to apply to any of the many known adhesives such as the lacquer or solvent types of hot melt adhesives containing a natural or synthetic resin such as thermoplastic resins, thermosetting resins in a thermoplastic stage. Mixtures of thermoplastics and thermosetting resins or resins mixture with waxes, waxes given adhesive properties by the inclusion of natural or artificial rubber or thermoplastic cellulose compounds. The thermoplastic resins are well known and above are referred to by way of example only and not as a limitation to the particular type of adhesive employable in the present apparatus. However the adhesive **22** in container **21** is to be in the molten or liquid stage and can be maintained by heating container **21** in any conventional manner (not shown) whereupon roller **20** during its rotation will pick up a thin coating of the adhesive upon its periphery and transfer the same to the periphery of roller **19** which in turn will coat a thin film of the adhesive upon the periphery of roller **18** which roller being heated will maintain the adhesive in its molten state.

In the operation of the present apparatus web **6** is brought to bear upon the side of web **1** having the lateral bands of adhesive **3** and roller **9** is caused to rotate by the motor **10** at a speed such that projection **17** will contact web **1** only at such times as a band of adhesive **3** is between rollers **9** and **18**. Thus, the projection **17** will compress webs **1** and **6** together at their portions containing each band of adhesive therebetween against roller **18** whereupon the thermoplastic adhesive **3** due to the pressure imparted thereon by projection **17** and roller **18** and the heat from roller **18** will adhere to web **6** joining the same to web **1**, but only of those portions contained by said adhesive. In the same time the free side of web **6** engaging roller **18** will receive a band of thermoplastic heat seal adhesive **23** laterally and across and coinciding with band **3**, but on an opposite side of the web **6**. The webbing continuing over roller **5** will have the heated adhesives **3** and **23** cooled by said roller setting the adhesives for hardening the same.

The resulting multi-ply webbing passing from roller **5**, which may be a driven roller, will continue to a conventional cutting machine (not shown) whereupon individual bag blanks such as shown in FIG. 3 will be formed therefrom with each portion of the webbing between the bands of adhesives **3** and **23** forming an individual bag blank, that is, by severing the webbing through the medial portions of the bands of adhesive. The resulting bag blank will consist of a substantially rectangular liner formed from web **6** and a similarly shaped cover sheet from web **1** joined at their top and bottom marginal edges by bands of adhesive **3**. Portions of the bottom marginal edge of said liner and cover are severed therefrom leaving joined tabs **24** and **25** extending from the medial bottom edge with tab **24** containing a portion of a band of adhesive **23** as does the upper marginal edge of the liner as shown in FIG. 3.

In forming the bag from said bag blank, the blank is formed into a tube as shown in FIG. 5 with overlapping ends **26** and **27** which ends can be sealed together in any known manner. Thereafter joined tabs **24** and **25** are bent upwardly whereupon the adhesive **23** can be caused to adhere to the bottom edge of the cover by pressing and heating the same, melting adhesive **23** and causing the same to adhere closing and sealing off the bottom edge of the bag as shown in FIG. 6. Thereafter the bag can be filled either manually or by means of a conventional automatic packaging machine whereupon by applying heat and pressure to the top marginal edge of the bag, the adhesive **23** upon the liner will cause the opposing faces of the liner to adhere together sealing the bag.

As a modification to the present process, apparatus and bag, projection **17** of roller **9** can be in rolling contact with a heated roller **28** which in turn is in contact with a roller **29** likewise in rolling contact with a roller **30** partially submerged in a molten bath of thermoplastic heat setting adhesive **31** within a heated container **32**. Accordingly, said adhesive **31** is transferred by rollers **30**, **29** and **28** to the end of projection **17** whereupon as said projection engages web **1**, the same is coated with a lateral band of adhesive **33** coinciding with bands **3** and **23**.

Accordingly, band **33** will appear upon the outer top marginal edge of the bag cover formed from web **1** as shown in FIGS. 5, 6 and 7 whereupon labels, handles or the like **34** can be attached to the bag by applying heat and pressure thereto after folding the same over the top edge of the bag as shown in FIG. 7.

The term sheet material as employed herein refers to any material suitable for making bags, as for example paper or papers coated or penetrated by other materials in order to render the same moisture, or moisture vapor proof and particularly it has been found that the present process and apparatus is particularly suitable for use in connection with papers such as glassine papers or supercalenderized opaque sulphite paper such as those described in United States Patents:

No. 2,118,152 issued May 24, 1938
No. 2,367,563 issued January 16, 1945; and
No. 2,624,246 issued January 6, 1953.

However, such sheet materials are given merely by way of examples and are not to exclude the use of other bag forming materials as suitable for use with the present process and apparatus.

The present process and apparatus and form of bag blank and bag are capable of considerable modification and such changes thereto as come within the scope of the appended claim are deemed to be a part of the present invention.

I claim:

A method of producing duplex bags which consists in advancing and guiding a pair of similar continuous webs of wax-coated sheet material into line and with their opposing faces in contact, forming a series of spaced apart lateral bands of a heat sealable material over said wax coating along the length of one of said webs on the face thereof contacting said second web, simultaneously pressing and heating said contacting webs at each portion containing a band of heat sealable material adhering said webs together at each of said bands while forming a further series of bands of heat-sealable material coinciding with said first series of bands and spaced along the length of the free side of said second web, cutting said adhering webs into a plurality of bag blanks at said bands of sealable material, folding said blanks with opposite sides overlapping forming tubes and heating alternate bands of said second web free side closing the bottom of the bags and leaving the remaining bands for being heated to seal the tops of said bags after filling.

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