June 25, 1963 A. B. HASLACHER 3,094,905

PROCESS FOR MAKING BAGS

Filed July 8, 1960 2 Sheets-Sheet 1

Fig. 1

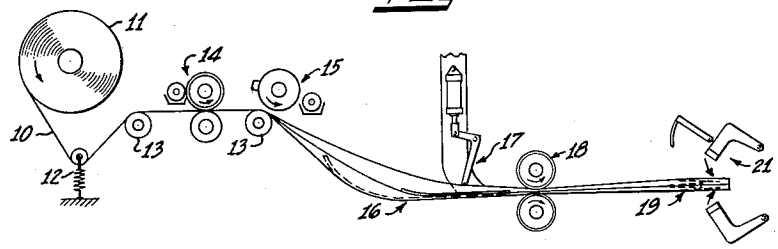


Fig. 2

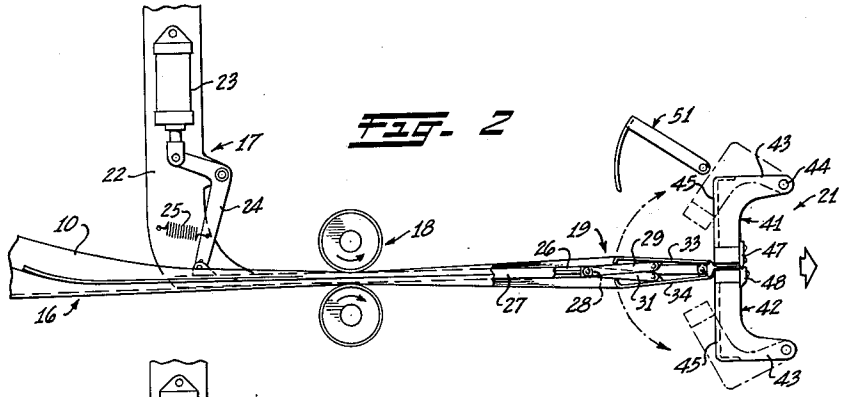
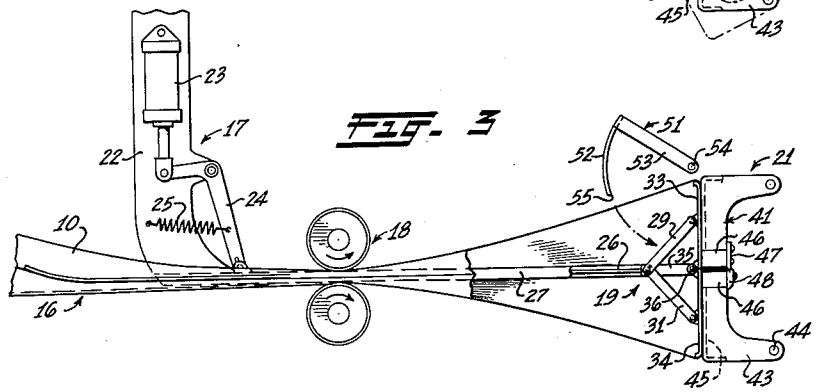


Fig. 3



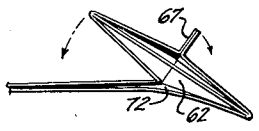


Fig. 6

INVENTOR:
ALFRED B. HASLACHER,
DECEASED, BY ROBERT HASLACHER, ADMINISTRATOR
BY Cockhoff and Slick
ATTORNEYS

June 25, 1963 A. B. HASLACHER 3,094,905

PROCESS FOR MAKING BAGS

Filed July 8, 1960 2 Sheets-Sheet 2

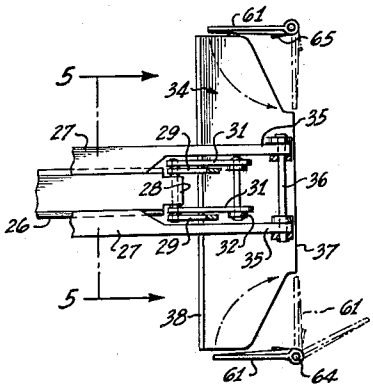


Fig. 4

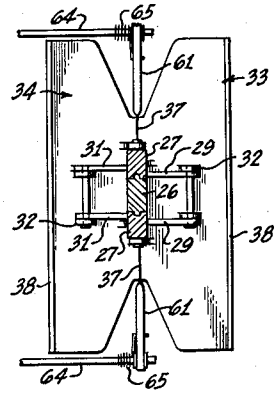


Fig. 5

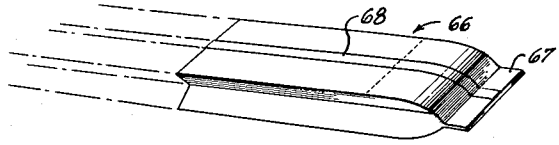


Fig. 7

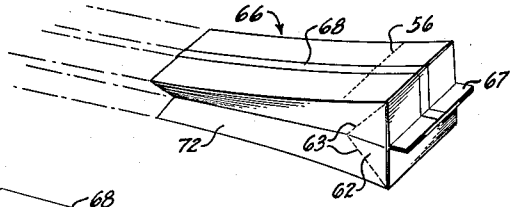


Fig. 8

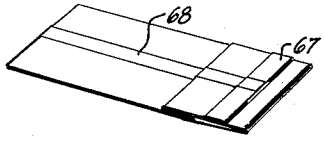


Fig. 9



Fig. 10

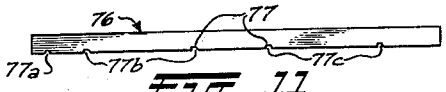


Fig. 11

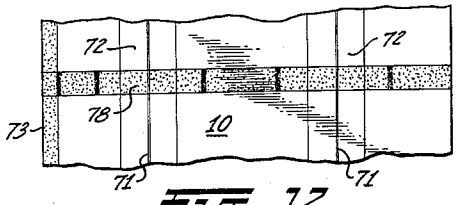


Fig. 12

INVENTOR:
ALFRED B. HASLACHER,
DECEASED, BY ROBERT HASLACHER, ADMINISTRATOR
BY Eckhoff and Slick
ATTORNEYS

United States Patent Office 3,094,905 Patented June 25, 1963

3,094,905

PROCESS FOR MAKING BAGS

Alfred B. Haslacher, deceased, late of San Francisco, Calif., by Robert L. Haslacher, administrator, 817 Greenwich Place, Palo Alto, Calif.

Filed July 8, 1960, Ser. No. 41,701
1 Claim. (Cl. 93—35)

This invention relates generally to improvements in the art of producing bags of the gusseted type with certain modifications and refinements. The invention is directed more particularly to the continuous production of completely formed, folded and properly sealed bags from a continuous source of sheet material normally supplied in roll configuration.

A primary object of this invention is to provide means for commercially producing an improved, superior gusseted bag utilizing an efficient method of inexpensively forming a rectangular or squared bottom in conjunction with the sealing of the transverse or bottom terminal flap.

It is well known in the packaging industry to fabricate bags of the type commonly called "automatic" or square-bottomed in which the bag-opening motion will result in the bottom portion assuming a transverse position so the bag will stand in an upright position to facilitate filling. However, this type of bag has previously been expensive to manufacture because of the various slitting, trimming and pasting operations which must be performed on the bottom.

The ordinary type of side gusseted bag is cheaper to produce but is considered less acceptable for commercial use since it is more difficult to open and does not provide other desirable handling advantages of the above-mentioned automatic bags. In addition, this type of bag normally is not properly sealed against seepage therethrough of liquids or fine-grained materials.

The chief aim of the present invention is to enable the economical manufacture of large quantities of bags incorporating the best features of both the automatic and gusseted type bags with special apparatus providing for the forming of a rectangular bottom substantially with the bag bottom or terminal flap sealing operation.

More particularly, it is the primary object of this invention to facilitate the manufacture of reliable bags by utilizing a mechanism including a reciprocating expansible ram during the manufacturing process to transform the ordinary gusseted bag into one having the generally desirable handling characteristics and features of that type known in the art as an automatic bag.

It is a further object of the present invention to enable the expeditious production of properly sealed bags by the addition of extra adhesive material in a particular manner to completely fill the voids at the terminal flap occasioned by the material folding and over-lapping process. This procedure obviates the possibility of leakage at the flap upon completion of the forming and sealing operation, and also precludes the necessity for utilizing the usual staggered die-cutting and special folding and handling of the bottom portion.

Other objects and advantages of the invention will become apparent from the following detailed description of the attached drawing wherein:

FIG. 1 is a diagrammatic view illustrating generally the sequence of operations utilized to produce a bag;

FIG. 2 is a side view of the bag flap sealing mechanism with the bottom shaping ram shown in the inoperative position;

FIG. 3 is similar to FIG. 2 but with the apparatus in the operative or extended position;

FIG. 4 is a top view of the expansible ram in closed position;

FIG. 5 is an end view of the ram in open or bottom forming position;

FIG. 6 is a side view of a partially folded bag;

FIGS. 7, 8 and 9 are sequential views of a bag during various stages of the bottom forming operation;

FIG. 10 is an exaggerated cross-section of a sealed terminal flap;

FIG. 11 is a view of the adhesive applying bar;

FIG. 12 is a partial view of the sheet material showing the placement of adhesive thereon.

Referring now to the drawings, the major parts and mechanisms required to complete the forming, shaping and sealing operations are shown diagrammatically in FIG. 1 to illustrate the sequence of the manufacturing operation. A web of flat sheet material **10** is supplied from a rotatably supported roll **11**, is guided around a tension control mechanism **12** and roller supports **13** to receive a continuous stripe of adhesive along one margin from applicator **14** to provide for the longitudinal seam to be completed later. A second applicator device **15** provides a special transverse band of adhesive at the proper predetermined longitudinal intervals for the subsequent terminal flap sealing operation. Scoring of the sheet for later folding may also be accomplished at this point utilizing the usual methods.

The sheet material is next formed into a generally open tubular configuration with reentrant flaps folded inwardly by a tube forming unit **16**, passing around the supporting leg of the reciprocating ram framework **17** to the longitudinal seaming unit **18**. The completed tube then moves over the expansible forming mechanism **19** at the extremity of ram framework **17** to the transverse or terminal flap sealing unit **21** where the bottom is shaped to the desired rectangular or squared conformation while the terminal flap is being sealed.

The functions of the reciprocating drive mechanism and the expansible ram for shaping the bag bottom against the transverse sealing fixture are best shown in FIGS. 2 and 3. As previously stated, the web of sheet material **10** is fed around the upright supporting leg **22** of the reciprocating ram framework **17** in the form of an uncompleted tube open at its top. A fluid operated cylinder **23** is mounted on leg **22** and functions through bell crank lever **24** against the pull of spring **25** to move the sliding ram element **26** horizontally in the grooved guide members **27** of the ram framework **17**. Spring **25** may be omitted if the drive cylinder **23** is of the double-acting type or positively driven in both directions.

Pivotally connected to the projecting end **28** of reciprocating element **26** are two sets of connecting lever arms **29** and **31**. (Also see FIGS. 4 and 5.) The opposite ends of levers **29** and **31** are hingedly pinned by means of integral upstanding lugs **32** to bottom shaping plates **33** and **34**. These plates are also pivotally supported at their inner ends on extensions **35** of grooved guide members **27** by means of shaft **36**. Thus, longitudinal movement of slider element **26** with reference to guide members **27** will cause plates **33** and **34** to rotate outwardly about the shaft **36** until mating edges **37** engage each other so that the plates form a continuous unbroken flat surface. Opposite edges **38** of plates **33** and **34** are preferably slightly bent radially to prevent tearing of the material during the bottom shaping operation.

The transverse terminal flap sealing unit **21** comprises a pair of spaced, cooperating rotatable elements **41** and **42** each of which is made up of supporting arms **43** pivotally mounted as at **44**. Generally flat plates **45** are attached to the forward ends of arms **43** to which are also attached the transverse sealing bars **46**. Plates **45** and sealing bars **46** serve together to form a smooth surface against which the bag material is pressed during the shaping procedure. Sealing bars **46** may be of the electrically

heated type if desired for the simultaneous application of heat and pressure for the sealing of thermoplastic sheet material or the like. Either one or both of the sealing bars **46** may be provided with relieved portions in the working face to accommodate the increased thickness of the material at the seam and gussets. A cutoff knife **47** and cooperating shearing jaw **48** may be attached to elements **41** and **42** to provide for severing the continuous tube simultaneously with the sealing operation.

A generally claw-shaped assembly **51**, comprising an arcuate plate **52** and supporting arms **53** is pivotally supported at fulcrum points **54** and is adapted to be rotatably operated (by means not shown) in a counterclockwise direction immediately after retraction of the bottom shaping plates to their closed position. Edge **55** of plate **52** is adapted to contact the top side of the squared bag to induce folding of the material along the previously applied score line **56** so the bag will attain the configuration shown in FIG. 6. The terminal flap may be folded over by any known mechanism and adhesively secured if deemed essential.

If it is found to be necessary for expeditious operations, pivoted tucking fingers **61** may be provided for initiating the infolding of the triangularly shaped portions **62** of the guests during the collapsing or flattening of the squared bag bottom, score lines **63** having previously been applied in the proper location. Fingers **61** are rotatably mounted on rod supports **64** and are operated simultaneously with the actuation of bottom shaping assembly. Springs **65** are provided to bias the fingers against actuating rods **64** but permit the fingers to move out of the way as the bag progresses past the shaping assembly and between the two parts of the terminal flap sealing mechanism to the finished bag stacking trays (not shown).

The sequence of the squared bottom bag shaping and folding operation is best illustrated in FIGS. 7, 8 and 9; wherein FIG. 7 shows the generally tubular end portion **66** as it appears after the transverse bottom sealing operation of terminal flap **67** has been completed, the longitudinal overlap seal **68** having been previously accomplished by unit **18**. Sealing bars are omitted for clarity. FIG. 8 shows the end portion **66** after the squaring operation has been completed by actuation of the reciprocating ram, and consequent pressure of the shaping plates against the flap sealing unit. The folding score line is indicated at **56** and the triangularly shaped infold portion is located at **62** with score lines **63**. In FIG. 9 the end has been severed and the resulting bag is illustrated in the completely flatened position ready for stacking and packing.

FIG. 10 is an exaggerted transverse cross section through the terminal flap **67** at the bottom of a bag which has been sealed in accordance with one embodiment of this invention. At the extremities **71** of the inner folds of the reentrant flaps **72** and at the inner end **73** of overlap **68** there normally exist areas which are devoid of sealant by virtue of the offset of the sheet material at these points. In order to satisfactorily fill and seal these voids, adhesive is applied in sufficient volume on specific areas of the sheet material prior to the flap sealing in a manner to be explained.

An adhesive applying bar **76**, shown in FIG. 11, is

a part of the applicator device **15** previously mentioned. Bar **76** is fabricated with the required number of slots or indentations **77** to provide for transfer of additional adhesive at predetermined spots. The slots **77** are appropriately spaced in accordance with the dimensions of the bag being fabricated. It will be readily apparent that by having an increased amount of adhesive applied to the sheet material at specific areas of the transverse band **78**, this surplus can be utilized to advantage to prevent voids from occurring in the completed terminal flap seal. Slot **77***a* is properly located to take care of the over-lap at **73** while a pair of slots **77***b* cooperates to supply additional adhesive to accommodate the usual void at the inner end **71** of one re-entrant flap and similarly pair **77***c* the opposite flap.

The placement of these heavier quantities of adhesive on the sheet material prior to the folding operation can best be seen in FIG. 12, wherein the darker shaded areas indicate the surplus applied for obviating the voids which result from the usual manufacture of terminal flap seals. Preferably, the adhesive is of heat sealing nature in order that a siftproof bag be produced.

What I claim is:

The process of producing bags from sheet material comprising:

(*a*) continuously advancing a continuous web of sheet material;

(*b*) applying a continuous adhesive stripe to one longitudinal margin of the continuously advancing material;

(*c*) applying transverse bands of adhesive at right angles to said stripe of adhesive material said bands being applied at predetermined spaced intervals along the length of the material and said band of adhesive being applied in varying amounts across the width of the material with the greatest amount of adhesive being applied at points corresponding to offsets on the finished bags;

(*d*) thereafter folding the sheet material to form a generally flattened tube having inwardly disposed gussets, the outer edges of the material being overlapped and united along the line of the adhesive stripe;

(*e*) pressing an end of the generally flattened tube together to form a transverse, face-to-face seal;

(*f*) expanding the thus sealed end of the bag to form a rectangular bottom by exerting force from inside the bag against the bottom of the bag;

(*g*) folding said bottom against a sidewall of said bag; and

(*h*) severing the material to form the completed bag detached from the web of material.

References Cited in the file of this patent

UNITED STATES PATENTS

388,612	Appel	Aug. 28, 1888
2,125,306	Novick	Aug. 2, 1938
2,244,282	Bergstein	June 3, 1941
2,256,506	Wagner	Sept. 23, 1941
2,297,946	Doering	Oct. 6, 1942
2,353,746	Moore	July 18, 1944