United States Patent [19]

Shore

[11] **3,908,524**

[45] **Sept. 30, 1975**

[54] **RECORD JACKET MAKING MACHINE**

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[73] Assignee: **Shorewood Packaging Corporation,** Farmingdale, N.Y.

[22] Filed: **Jan. 4, 1974**

[21] Appl. No.: **430,950**

[52] **U.S. Cl.** ..... **93/62;** 93/13; 93/61 R; 270/32

[51] **Int. Cl.²** **B31B 19/74**

[58] **Field of Search** ..... 156/556, 564, 578, 582; 206/312, 313; 229;68 R/; 93/13, 61 R, 62, 8 R; 270/32; 11/2

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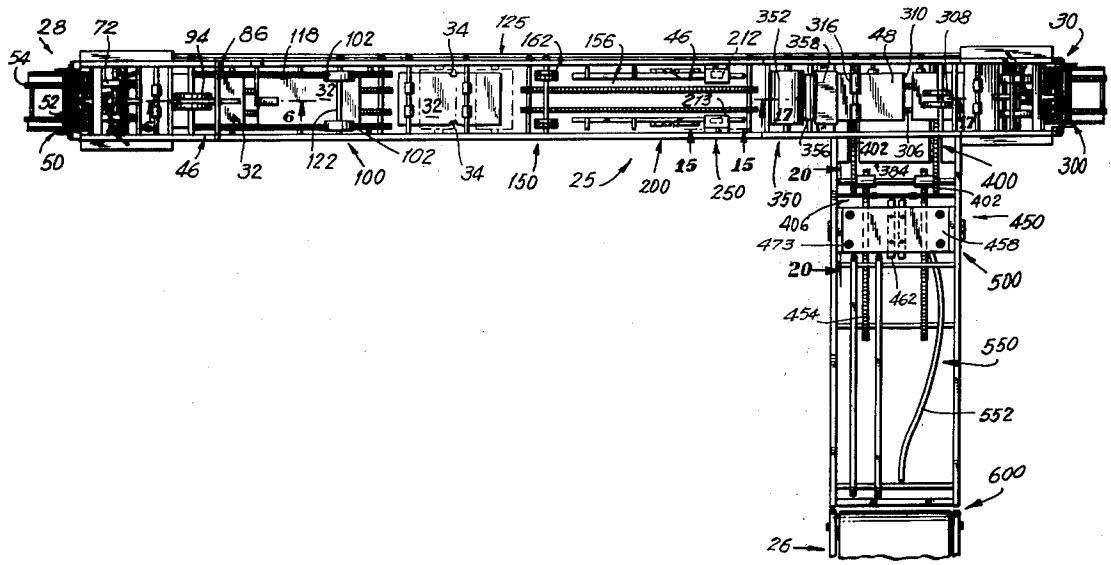
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Primary Examiner—Roy Lake
Assistant Examiner—James F. Coan
Attorney, Agent, or Firm—Kirschstein, Kirschstein, Ottinger & Franck

[57] **ABSTRACT**

The essence of the invention resides in the cooperative operation of synchronized components from which results the automatic production of one or two pocket record jackets. The invention comprises an elongated carriage having a laterally extending carriage portion forming a "T" shaped machine. At one end of the elongated carriage there is provided a feed mechanism which feeds a first paperboard blank to a notching station where a part of the longitudinal edges are notched. From the notching station the paperboard notched blank is fed to a scoring station where the notched blank is appropriately scored so that glue flaps may be formed at the feed station. Simultaneously, from the opposite end of the elongated carriage there is fed a second paperboard blank, from a feed station and the two blanks are joined together at a rotary station where the second blank is glued atop the first blank and where one or two phonograph record pockets are formed. The joined blanks are urged in a transverse direction onto the laterally extending carriage portion of the T shaped machine by a conveyor transfer mechanism. The joined first and second paperboard blanks thereafter travel to a die mechanism where they are scored and trimmed to form a spine and are moved to a second folding station where through a conveyor and bar device one half of the joined paperboard blanks is folded 180° along the score lines onto the other fold, thereby forming the completed record jacket having one or two phonograph record pockets.

24 Claims, 21 Drawing Figures



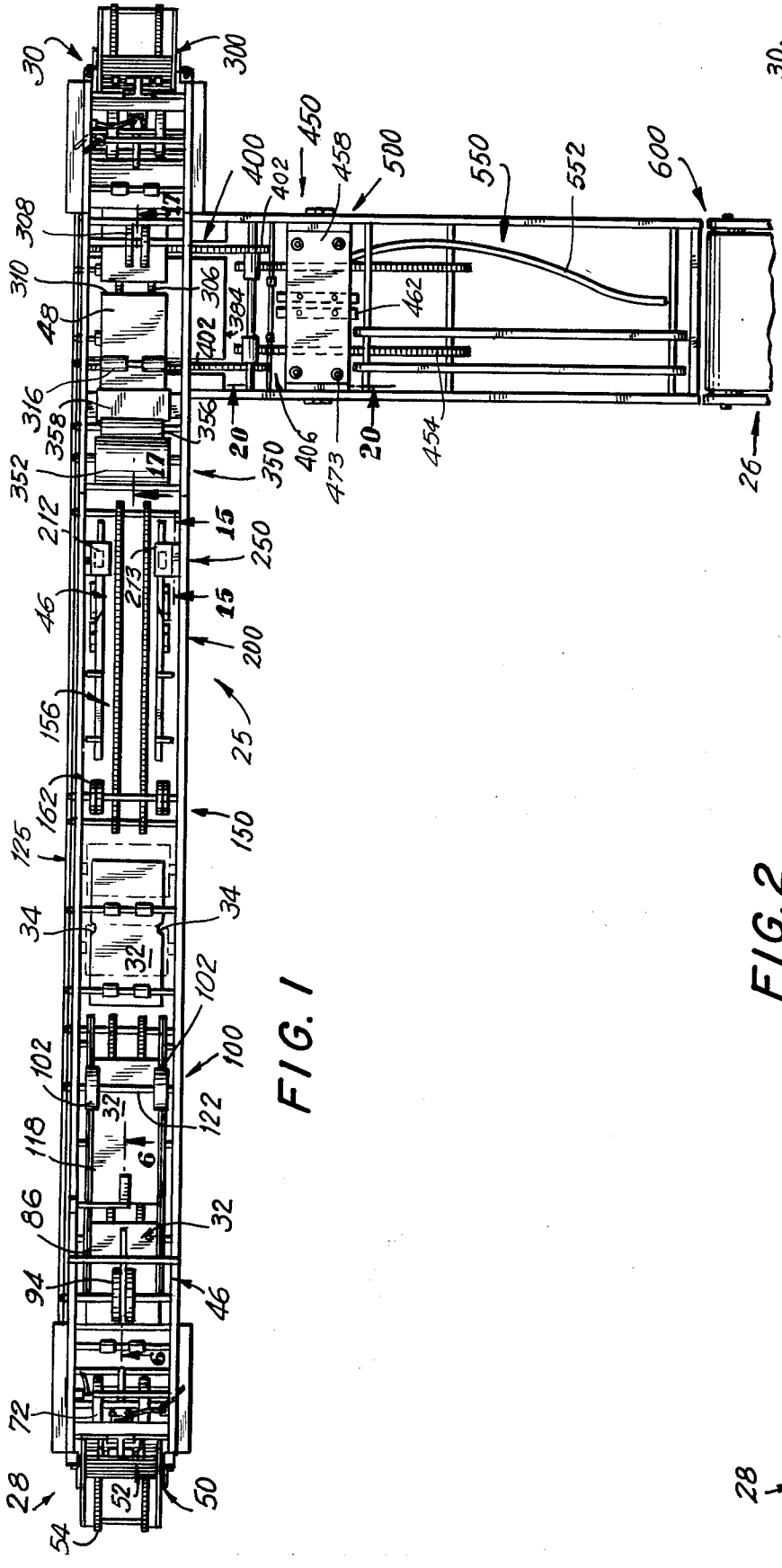


FIG. 1

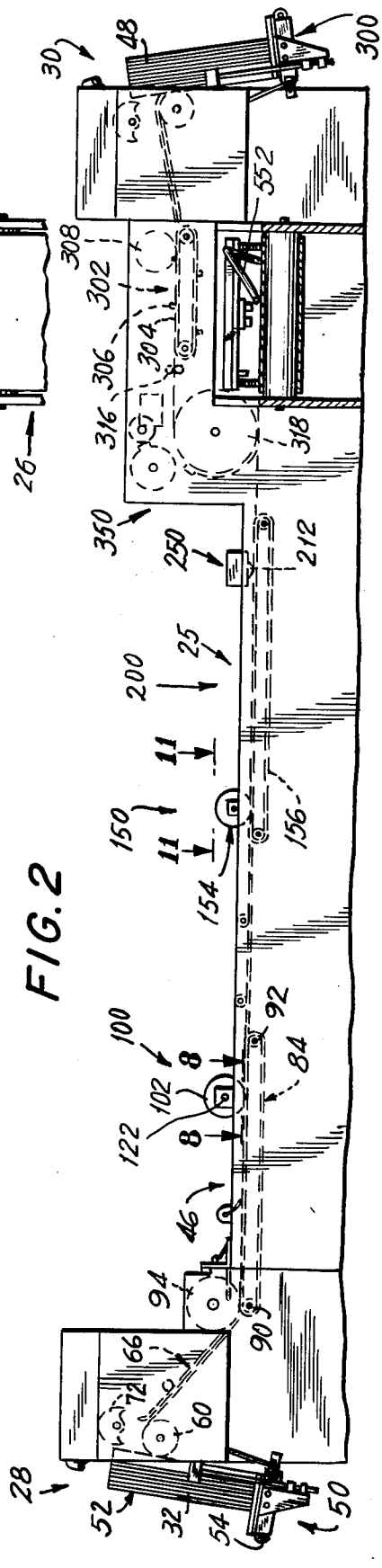


FIG. 2

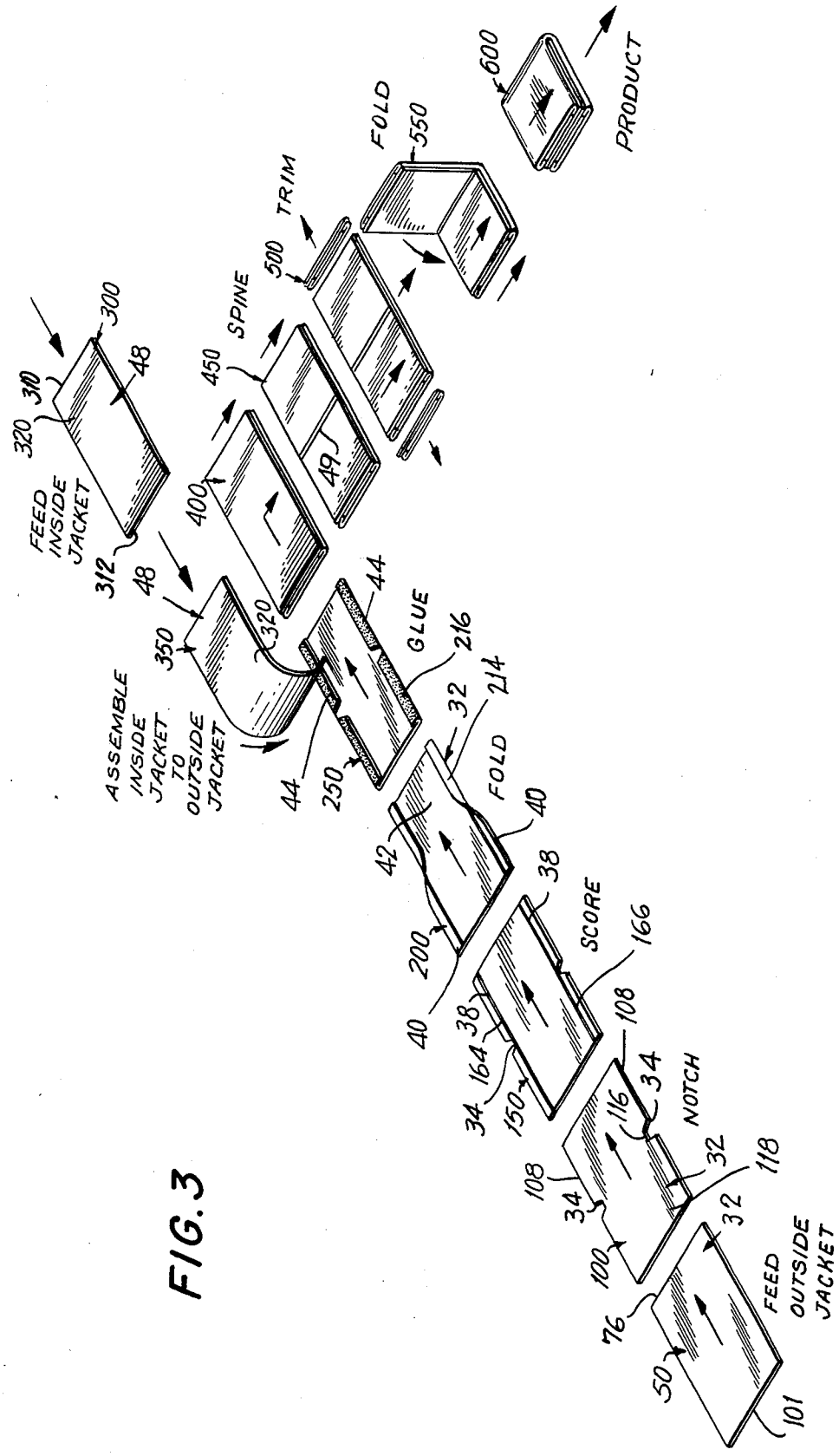

FEED INSIDE JACKET
ASSEMBLE INSIDE JACKET TO OUTSIDE JACKET
GLUE
FOLD
SCORE
NOTCH
FEED OUTSIDE JACKET
SPINE
TRIM
FOLD
PRODUCT
300
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320
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FIG. 3

FIG. 4

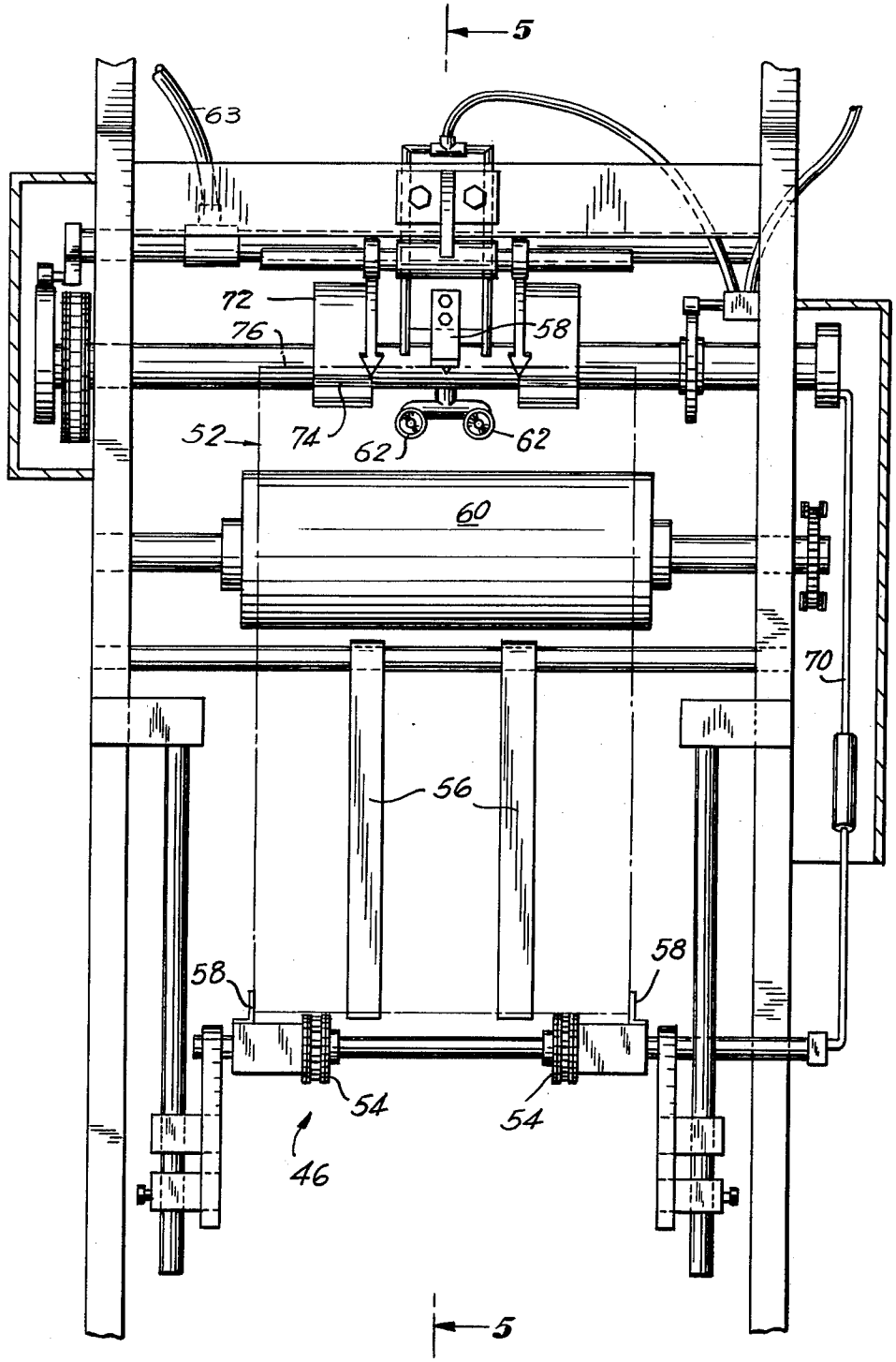


FIG. 5

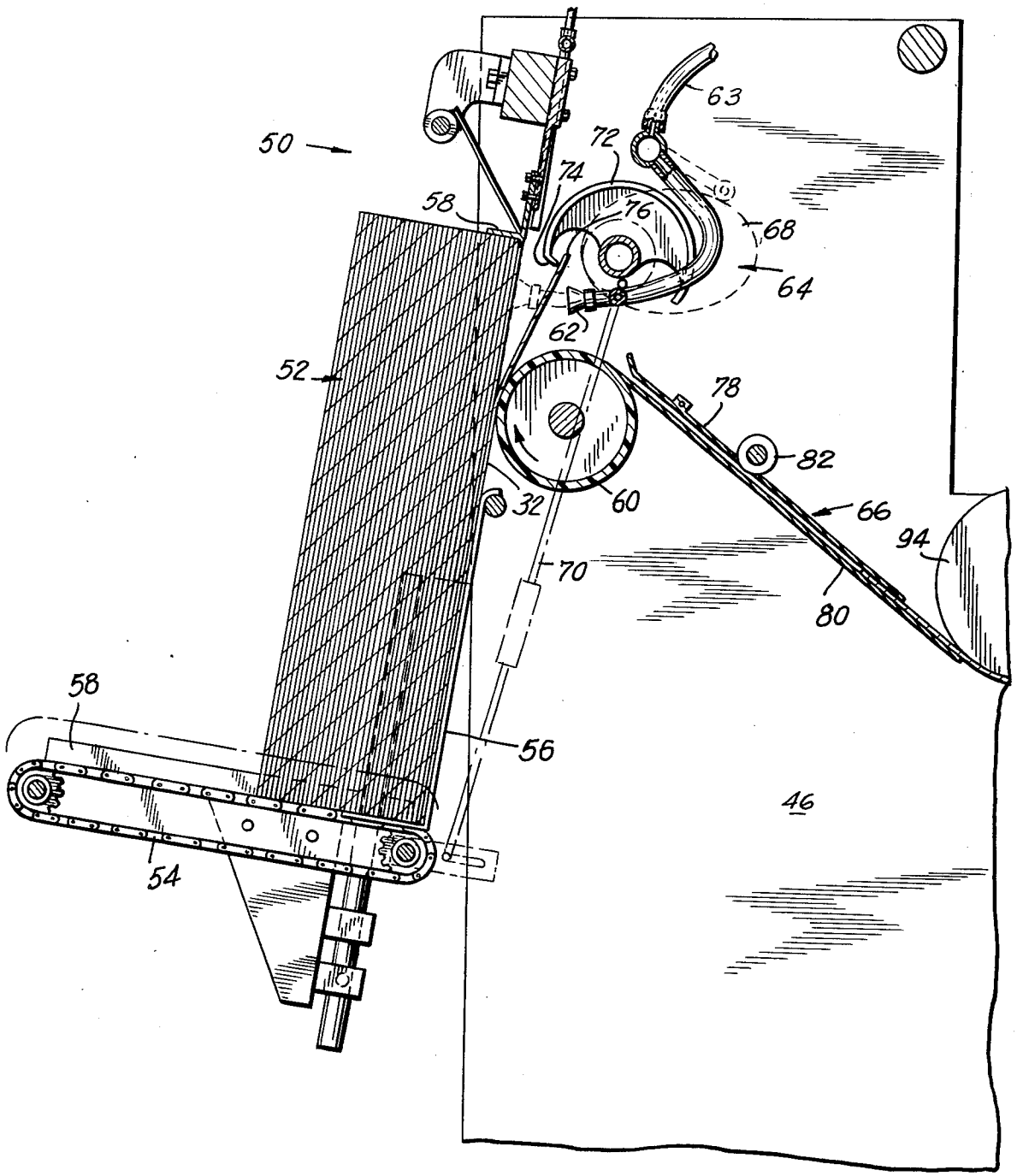


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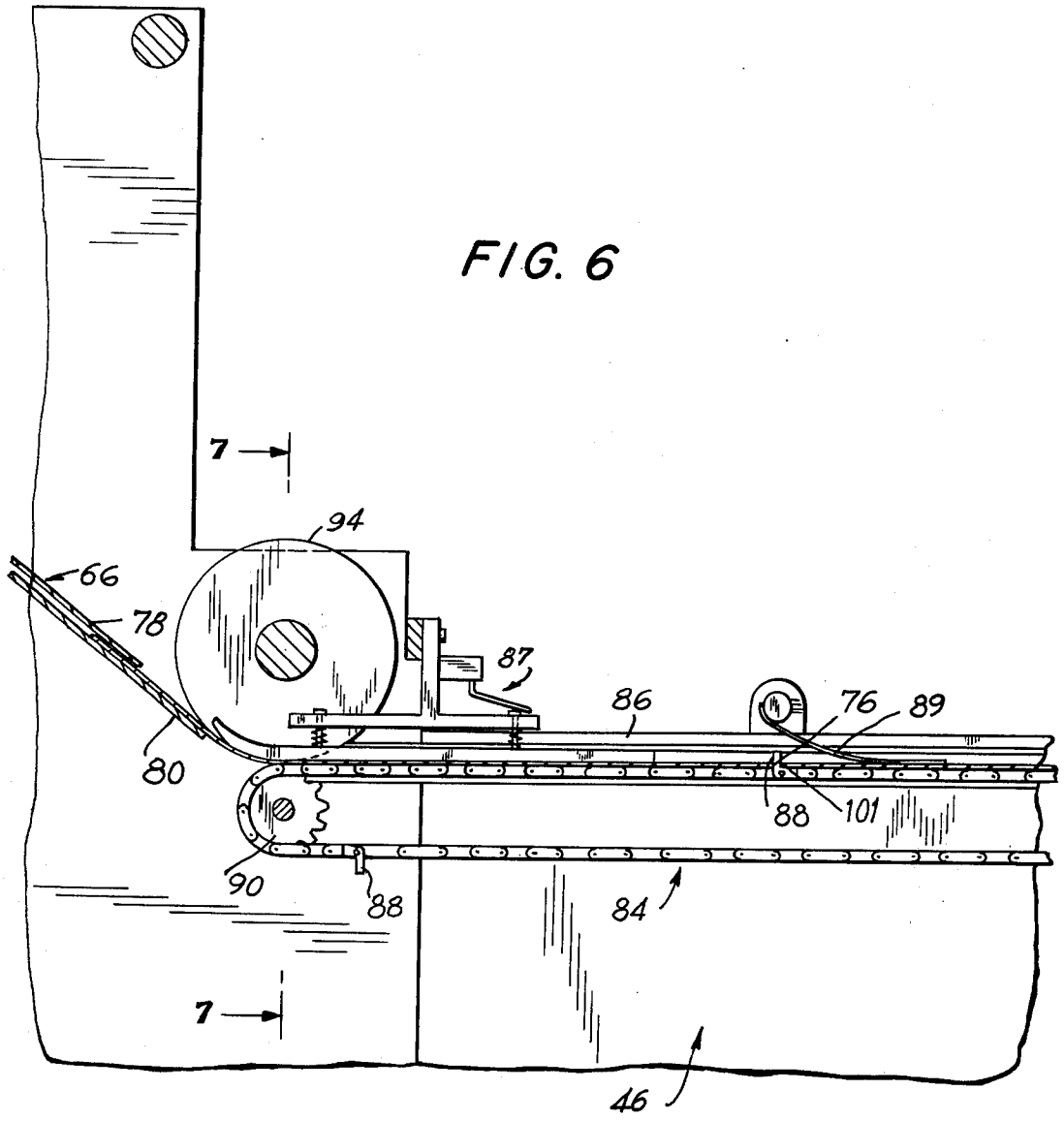


FIG. 7

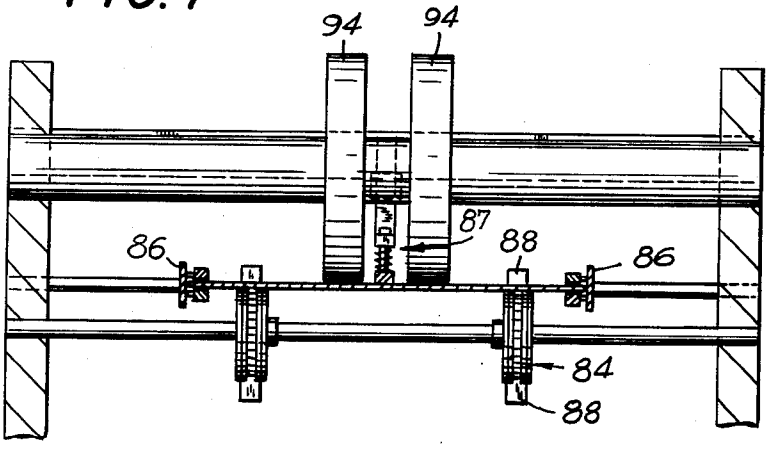


FIG. 8

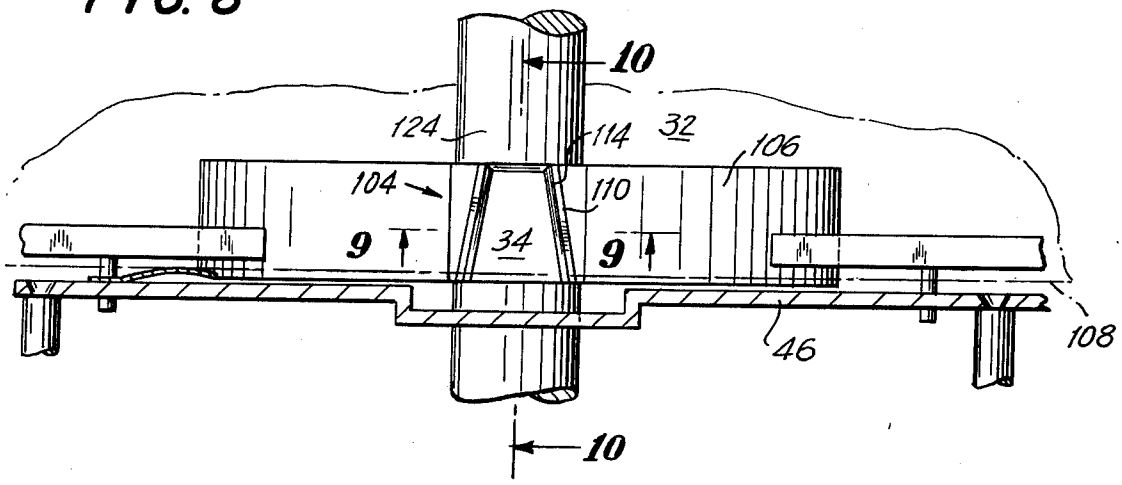


FIG. 9

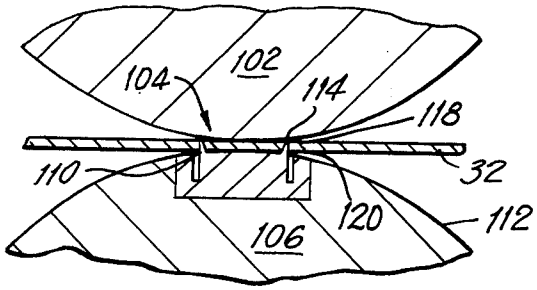


FIG. 10

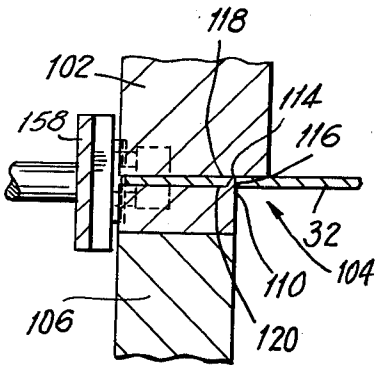


FIG. 11

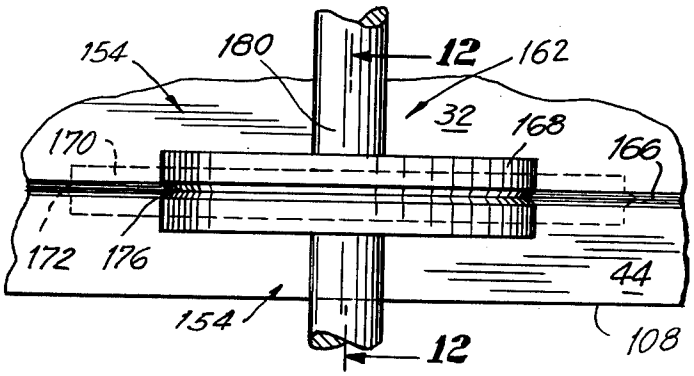


FIG. 12

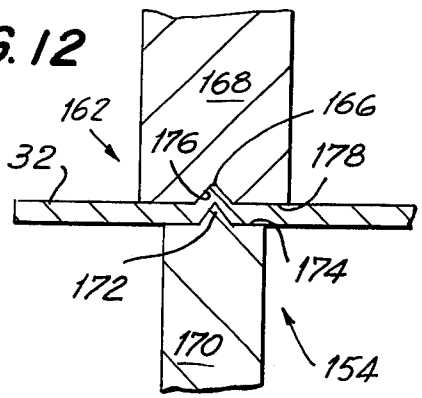


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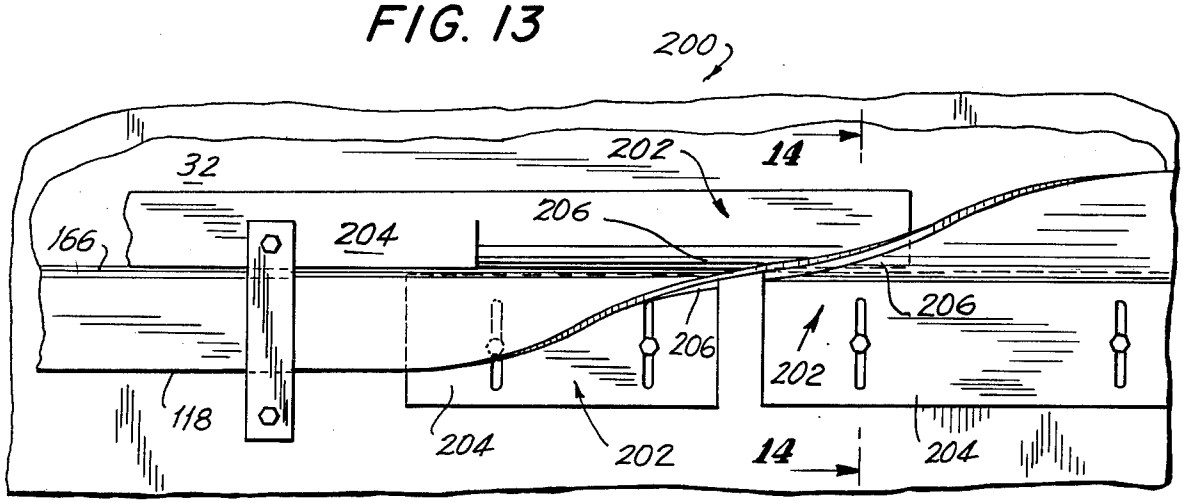


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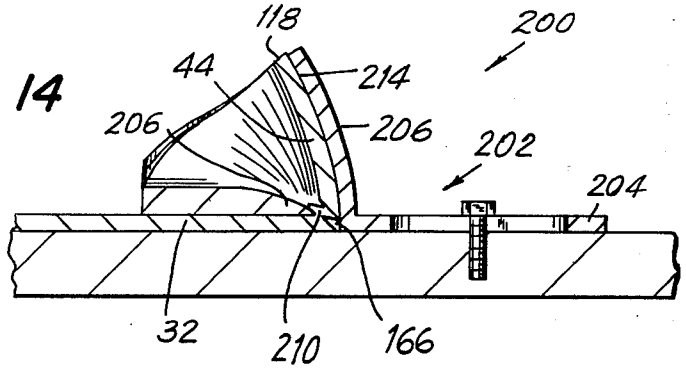


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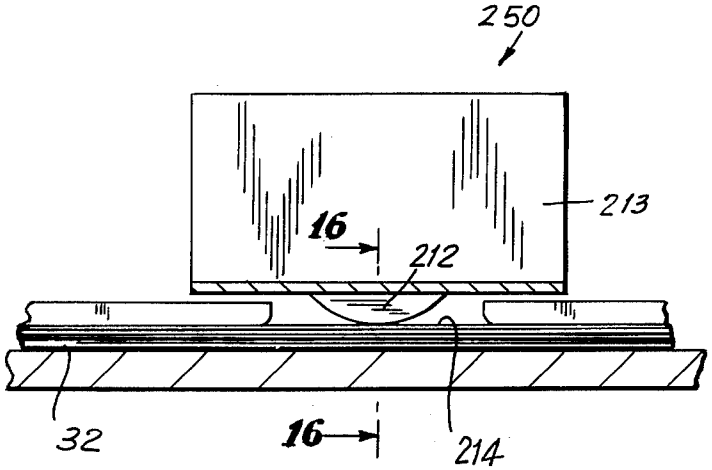


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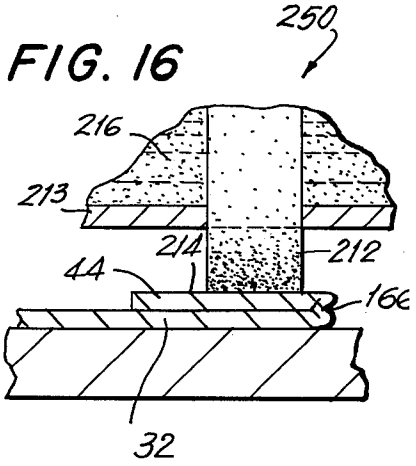


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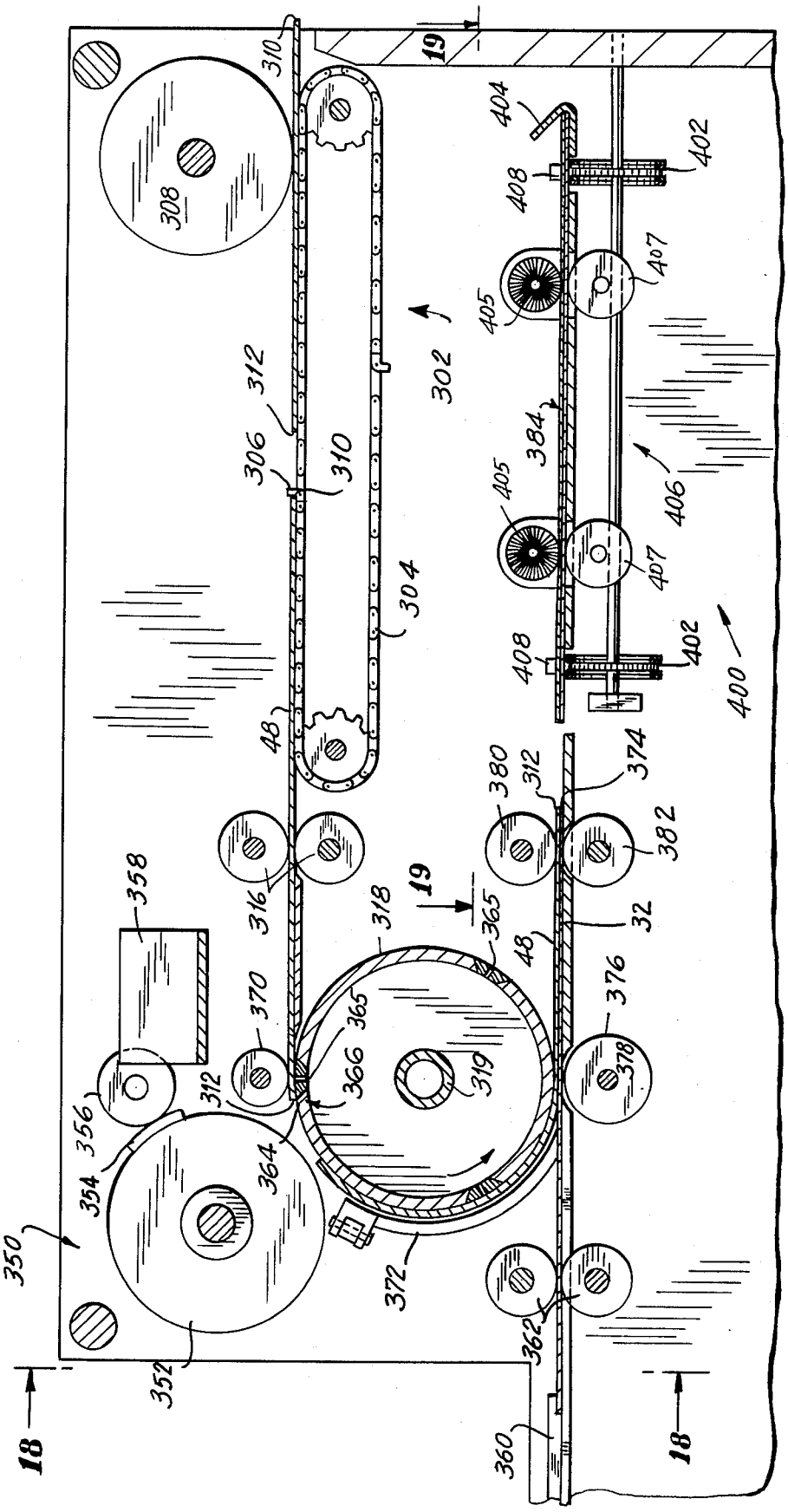

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FIG. 18

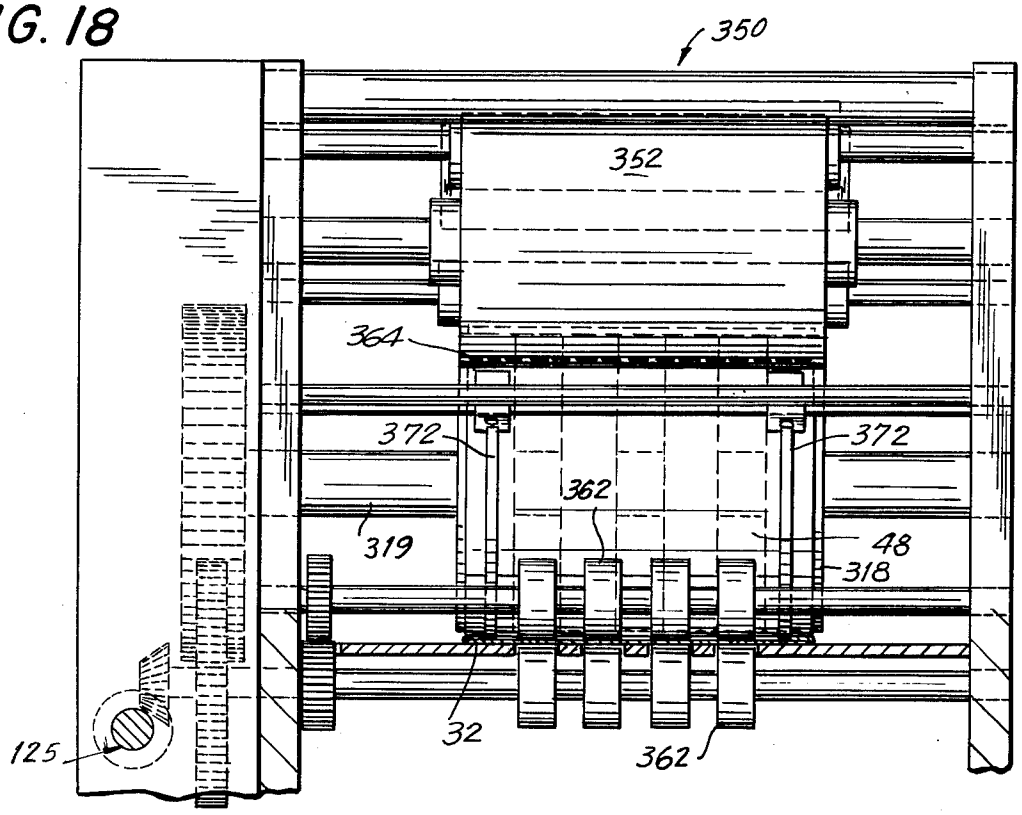
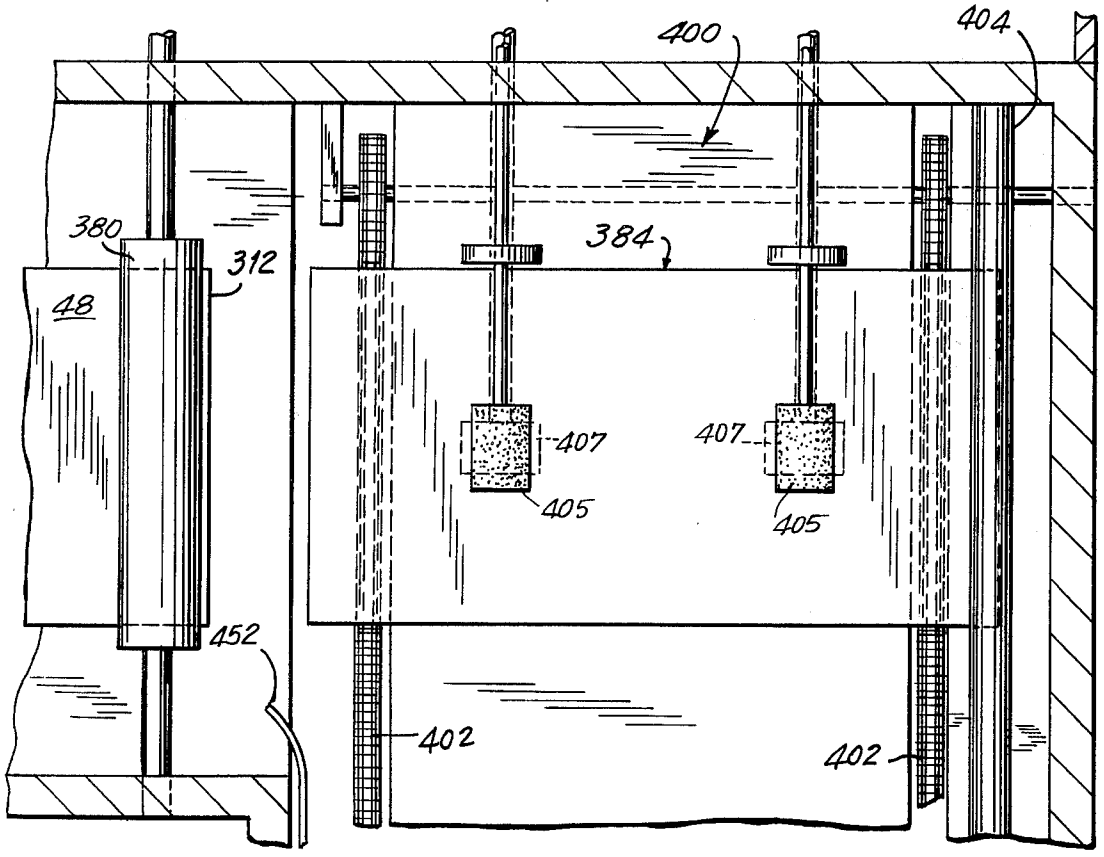

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FIG. 19


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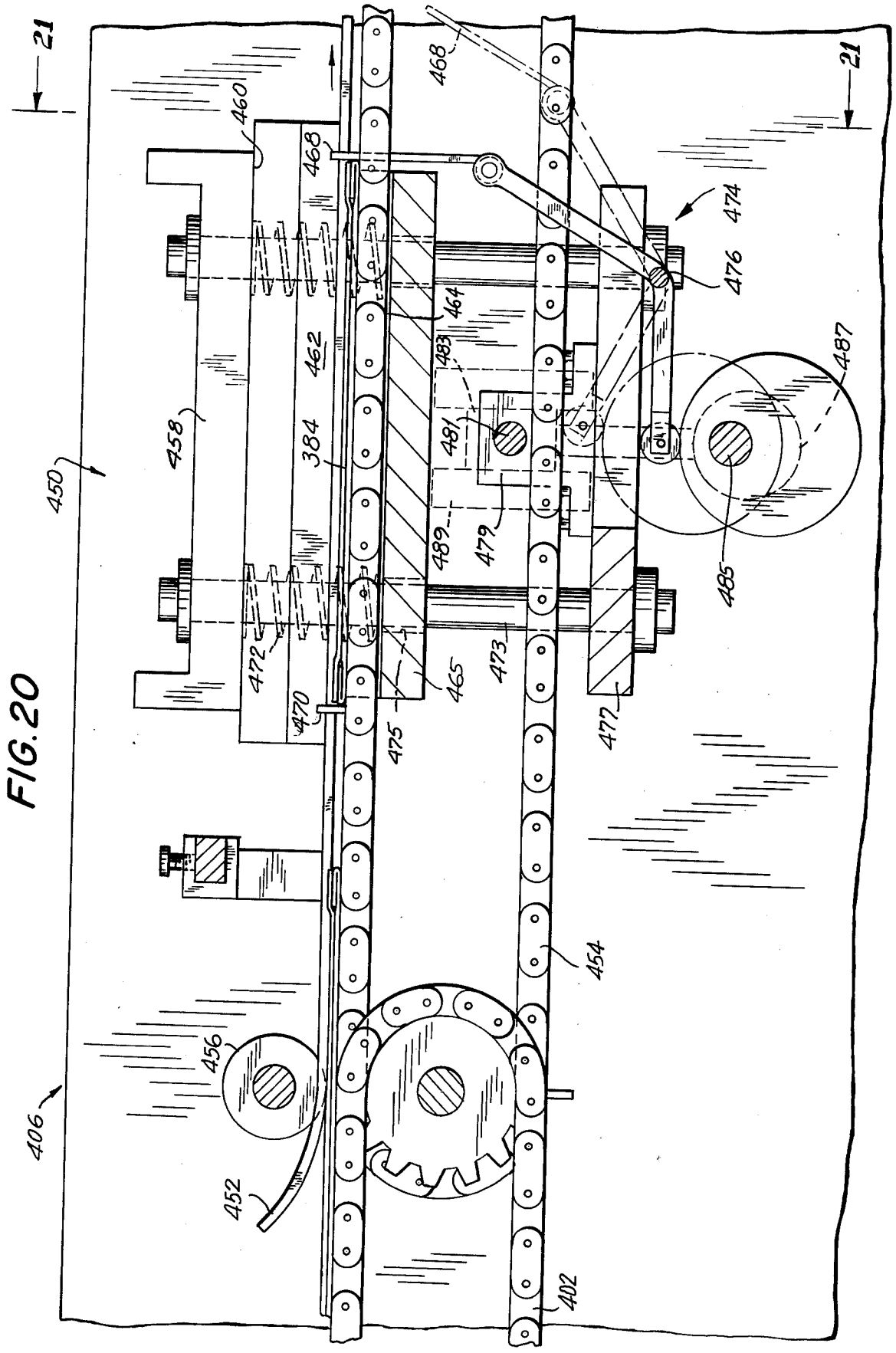

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FIG. 20

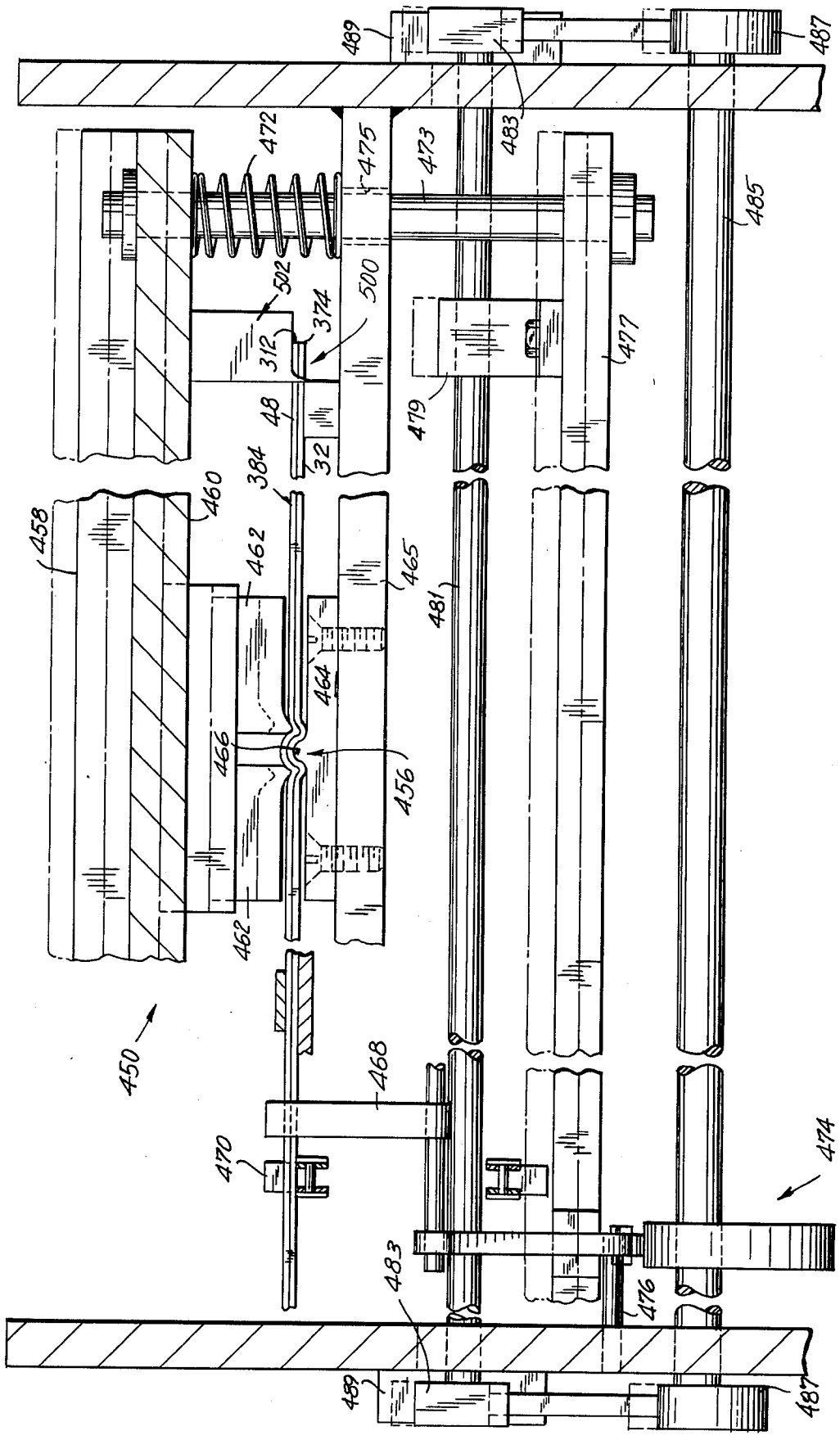

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FIG. 21

RECORD JACKET MAKING MACHINE

BACKGROUND OF THE INVENTION

1. Field of the Search

The present invention relates to an automatic record jacket making machine having one or two pockets which jacket is formed from two separated paperboard blanks.

2. Prior Art

Heretofore it has been known in the prior art to provide machinery for forming single pocket phonograph record jackets. In this instance machines were provided which could accommodate a paperboard blank of uniform thickness which would act as a folding and gluing machine. These machines, operating at low production levels, would generally form a single pocket jacket of acceptable quality but with the advent of multiple phonograph records in a single jacket these machines could not be used.

The record industry required newer forms of record jackets which could house one or two records and which jacket would have sufficient printing space to permit a higher degree of descriptive verbiage to aid in the sales promotion of the records.

Further, machines for making record jackets, which were available could not handle two different thicknesses of paperboard which would be used to form a single jacket. In most cases, the jackets which were made were formed from a single paperboard folded appropriately to form one or more pockets. This particular method produced an expensive jacket of generally poor quality and the machines had low level production rates. Moreover, because of the machinery used in making these jackets from a single sheet of paperboard, the jacket produced did not close properly creating all sorts of problems, not the least of which was stacking and storage. The machinery previously used also could not provide the proper registry of folded sides because of the nature of the folding and scoring mechanisms employed and, therefore, unsightly record jackets were produced.

In an industry which promotes various art forms, the packages (record jackets) which formed an important part of the sales promotion did not meet the aesthetic requirements of the record industry.

It was also thought that record jackets of high quality could be produced at a lower cost and at the same time improve the quality of the product.

SUMMARY OF THE INVENTION

It is the general object of the present invention to avoid and overcome the deficiencies of prior art record jacket forming machines by providing a unique arrangement of parts which will permit the forming of a one or two pocket record jacket from two independent paperboard blanks.

Another object of the present invention is to provide a machine for making record jackets from different thickness paperboard blanks.

A further object of the present invention is to provide a machine which will sequentially form a record jacket having one or two pockets.

Yet another object of the present invention is to provide a record jacket making machine which will produce record jackets with one or two pockets at a very high production rate.

Still another object of the present invention is to provide a record jacket making machine which will produce record jackets of high quality where the paperboard blanks which form the jacket are folded shut to permit easy stacking of the completed jackets.

Another object of the present invention is to provide a record jacket making machine whereby one or two pocket record jackets may be made by substantially simultaneously feeding independent paperboard blanks on aligned conveyor systems, which are synchronized, from opposite ends of the machine such that record jackets may be formed and folded.

A further object of the present invention is to provide a machine which will completely form and fold, ready for stacking, record jackets having one or two pockets, from two independent paperboard blanks.

Yet a further object of the present invention is to provide a machine for making one or two pocket record jackets from two independent paperboard blanks which are sequentially fed from different points on a carriage and formed on the same carriage.

Still a further object of the present invention is to provide a record jacket making machine which will permit a transverse section for folding and stacking record jackets.

BRIEF DESCRIPTION OF THE INVENTION

The foregoing and other objects of the present invention which will become more apparent as the description proceeds are achieved by providing an elongated machine carriage having feeding stations at each end thereof. A laterally extending carriage is connected to the elongated carriage providing a third path of travel synchronized to the feeding of independent first and second paperboard blanks being fed in opposite aligned directions from the opposite ends of the elongated carriage. The first paperboard blank is first fed to a die cutter where notches are formed in the outer longitudinal edges of the blank and thereafter transported to a second die scoring station where score line defining the glue flaps are formed. Having formed and defined the glue flaps the first blank is conveyed to the first folding station where means are provided to fold the flaps inwardly over the blank to creat glue flaps and where adhesive is applied to the upwardly facing surfaces of the glue flaps. The second paperboard blank, which may be of different thickness, is fed from the opposite end of the elongated carriage and is synchronized with and in alignment with the movement of the first blank onto a drum which rotates the second blank into position atop the glue flaps of the first blank in perfect alignment with the first blank. The joined blanks thereafter follow the same path of travel as the first blank and are conveyed abruptly transversely onto the laterally extending carriage to a spine scoring station where dies cut score lines in the joined blanks and a detent is formed between the score lines. The joined blanks are then fed by conveyor through a second folding station where one half the jacket is urged 180° degrees into a completely folded, closed position in which condition the record jacket is moved to a delivery station where the jacket may be stacked and/or packed.

BRIEF DESCRIPTION OF THE DRAWINGS

For a better understanding of the present invention, reference may be had to the accompanying drawings wherein like numerals of reference indicate similar parts throughout the respective views and wherein:

FIG. 1 is a plan view of overall machine.

FIG. 2 is a side elevation of the overall machine.

FIG. 3 is a schematic perspective view of various stages of the blanks, in the forming of a finished record jacket.

FIG. 4 is a front elevation of the blank feed station.

FIG. 5 is cross section along lines 5—5 of FIG. 4.

FIG. 6 is cross section along lines 6—6 of FIG. 1 of the take off of blanks from the feed station.

FIG. 7 is a cross section along lines 7—7 of FIG. 6.

FIG. 8 is a cross section along lines 8—8 of FIG. 2 of the notching station.

FIG. 9 is a cross section along lines 9—9 of FIG. 8.

FIG. 10 is a cross section along lines 10—10 of FIG. 8.

FIG. 11 is a cross section along lines 11—11 of FIG. 2 showing the scoring station.

FIG. 12 is a cross section along lines 12—12 of FIG. 11.

FIG. 13 is a plan view of the edge flap folding station.

FIG. 14 is a cross section along lines 14—14 of FIG. 13.

FIG. 15 is a cross section along lines 15—15 of FIG. 1 showing the edge gluing station.

FIG. 16 is a cross section along lines 16—16 of FIG. 15.

FIG. 17 is a cross section along lines 17—17 of FIG. 1 showing the inside jacket secured to the outside jacket and the right angle take-off.

FIG. 18 is a section along lines 18—18 of FIG. 17.

FIG. 19 is a horizontal cross section along lines 19—19 of FIG. 17.

FIG. 20 is a cross section along lines 20—20 of FIG. 1 showing the center score (spine) and trim. FIG. 21 is a cross section along lines 21—21 of FIG. 20.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The record jacket machine which comprises the invention herein is shown in its unitary form in FIGS. 1 and 2 and may be generally indicated by the reference numeral 25. Further, before describing in detail the structure of the overall machinery the schematic diagram of FIG. 3 should be examined and explained to more fully understand the various working stations of the record jacket making machine or machine 25.

In reality the machine 25 has three ends. Two of the three ends may be termed an input ends while the third end may be termed output end or the delivery end. At the delivery end 26 a complete, printed folded and stacked record jacket is delivered. At the first input end 28 there is provided a first feeding station 50 while at the second input end 30 there is provided a second feeding station 300. Two record jacket blanks feed in opposite directions but in longitudinal alignment with each other and are joined and then transmitted to the delivery end 26 of the machine 25.

As shown in FIG. 3, first feeding station 50 feeds the blank rectangular shaped first paperboard 32, to the notching station 100 at which point there is provided in the first blank 32 a pair of notches 34. After the first blank 32 has been notched the blank 32 moves along a conveyor system 36 to a scoring station 150 where scorelines 38 are cut into the blank 32 at appropriate positions. It should be noted that the first blank 32 is wider by approximately two inches in width than that of the finished jacket. The purpose of this added dimension will become apparent as the description of the preferred embodiment proceeds. The notched and scored blank 32 may be moved to the first folding station 200 where the outer edges 40 of the notched and scored blank are folded inwardly and back onto the main body 42 of the blank 32 along the score lines 38. In this manner, glue flaps 44 are formed. Moving along the elongated carriage 46 of the machine 25 the blank 32 has glue applied to the flaps 44 which have been folded inwardly. While the first blank 32 is being fed from the first feed station 50 longitudinaly along the elongated carriage 46 from station to station, a second blank 48 in axial alignment with the first blank conveyor system 36 is fed from the second feed station 300 in the opposite direction of the travel of the first blank 32, but in axial alignment therewith.

The two blanks 32, 48 come together and are joined at the assembly station 250 at which point the second blank 48 is laid atop the first blank 32 and is glued thereto. After the joining of first and second blanks the roughly formed record jacket is moved in the same direction as the first blank to the transfer station 400 at which point the direction of travel of the roughly formed jacket is changed to a motion transverse to the axial movement previously described and the roughly formed jacket is moved, to where a spine 49 is formed. After the jacket is fed to the spine scoring station 450 the ends of the roughly formed jacket are trimmed at the trim station 500 and thereafter moved to the second folding station 550 where the trimmed and spined jacket is folded into a record jacket to be stacked at the delivery end 26 of the machine 25.

Each station and its formal relationship with its succeeding and preceding stations will be hereinafter described in greater detail with appropriate reference numeral designation. This preceding description was merely for the purpose of setting forth in a very general manner the overall operation and function of the machine so that the more detailed description to follow will be more readily understandable.

FIRST FEEDING STATION

The first feed station 50 appears at the left hand side of the elongated carriage 46 (shown in FIG. 1) of the machine 25 and is more fully shown in FIGS. 4 and 5 herein. The first paperboard blanks or first blanks 32 are stacked in stacks 52 substantially vertical along a pair of feed belts 54 such that they lean against the inclined surface of a stack support member 56.

The first blank 32 is generally rectangular in shape with its length being approximately twice the diameter of the record to be contained within the finished jacket. However, the width of the first blank 32 is somewhat larger than the diameter of the record to be housed within the finished product. Each of the stacked paperboards first blanks 32 may be of any thickness from 9pts. to 30pts. and the stack 52 is held in feeding position on the belts 54 by the upper and lower guide members 58 as well as stack support member 56 to insure that each first blank 32 is fed to the position against the stack support member 56. As shown in FIG. 5, the

right-hand-most first blank **32** in the stack is in position to be rolled upwardly and forwardly by a rotating cylinder **60** and the action of a pair of suction cups **62.** The pair of suction cups **62** which are cam operated into position are adapted to engage each first blank **32** and to pull the first blank **32** forwardly as shown in FIG. **5.** The suction cups **62** are moved into position by the operation of a cam arrangement **64** and the cups receive the vacuum suction via hose **63** and pull a first blank **32** forwardly and upwardly over the rotatable cylinder **60** onto a feed slide mechanism **66.** As the cam **68** rotates the suction cups **62** are moved into position against the first in line paperboard blank **32.** The continued rotation of the rotating cylinder **60** operates to remove the first blank and **32** from the stack **52.** The rotating cylinder **60** further operates to move the first blank **32** upwardly and over the rotating cylinder **60.** The cam arrangement **64** is linked to the feed belts **54** via the linkage arrangement **70** so that the feed belts **54** are jogged to maintain the movement of the blanks down the inclined belts **54** to the support member **56.** As the first blank **32** is moved upwardly and forwardly somewhat over the rotating cylinder **60,** a rotating member **72** is in the form of a partial wheel is provided with a leading edge **74** which catches the upper edge **76** of the first blank **32** and serves to bend the blank downwardly over the rotating cylinder **60** so that the first blank **32** as it is urged upwardly by the rotation of the cylinder **60** and pulled forwardly by suction cups **62** and downwardly by the leading edge **74** is directed beneath a guide plate **78** and onto the feed plate **80.** A rotating idler **82** maintained over the feed plate **80** moves the first blank **32** onto a conveyor arrangement **84** for the movement of the first blank **32** to the notching station **100.**

At the bottom of the inclined feed plate **80** a pair of guide elements **86** guide the first blank **32** onto the conveyor arrangement **84** such that the formerly upper edge **76** of the first blank **32** in the stack **52** abuts against a pair of upwardly extending ears **88** which are periodically rotated to their upwardly extending position by the operation of a pair of link chain drive members **90, 92** which comprises the essence of the conveyor arrangement **84.** The guide elements **86** maintain the first blank **32** in longitudinal alignment with the elongated carriage, while an adjustable top guide **87** and spring guide **89** hold the blank onto the conveyor **84.**

In order to insure the abutment of the upper edge **76** of the first blank **32** against the ears **88** a drive wheel **94** is positioned at the bottom of the inclined feed plate **80** to insure the movement of the first blank **32** onto the conveyor **84** against the ears **88** in position between the guide elements **86.**

This initial alignment of the first blank **32** between the first feed station **50** and the notching station **100** is important because the succeeding sequence of operations are synchronized thereto.

NOTCHING STATION

The first blank **32** is fed by the two drive wheels **94** and fed between a pair of guide elements **86** onto the conveyor **84.** The conveyor **84** is periodically interrupted by a pair of stop members or ears **88** such that the first blank **32** is pushed along from its rearward edge **101** by stop members or ears **88.** The ears **88** which push the first blank **32** along the conveyor system **84** between the guides **86** also act as a point of synchronization for the second blank which is being fed from the opposite feed end of the carrier.

In order to form the notches **34,** which is the preliminary step in the formation of the glue flaps **44** as well as the division of the first blank **32,** a conveyor wheel **102** rotates in synchronized movement with the feed conveyor **84** such that the rotation thereof guides the first blank **32** over the rotating notch forming knife arrangement **104.** A second wheel **106** is rotatable immediately below the conveyor wheel **102** and the cooperative movement of the wheels **102, 106** forms the notch **34** in the approximate center of the side edges **108** of the first blank **32.** As shown in FIG. **9,** the conveyor wheel **102** and cutting wheel or second wheel **106** are positioned in vertical alignment such that the conveyor wheel **102** provides the downward pressure against the first blank **32** and forces the same downwardly into cutting arrangement with a cutting die **110** disposed in the outer periphery **112** of the cutting wheel **106.**

As shown in FIG. **8,** the notch **34** formed in the outer edges **108** of the first blank **32** takes a particular shape which the cutting edge **114** of cutting die **110** is adapted to form. FIG. **10** shows the cutting of the inner most edges **116** of the notch **34** by the cutting die **110** on the cutting wheel **106.** It should be noted that two cutting wheels **106** are provided such that the notch **34** is cut in both side edges **108** of the first blank **32.** At each side edge **108,** a rotating notch forming knife arrangement **104** is provided so that a notch **34** is cut in the upper side edge **118** of the first blank **32** and the lower side edge **120** of the first blank **32.** Both conveyor wheels **102** are connected for synchronous rotation by an axle **122** and both cutting wheels **106** are connected by an axle **124.** Both axles are driven by an appropriate drive shaft **125** as shown in FIG. **1** from which drive shaft **125** all rollers, feed mechanisms and conveyors are driven through appropriate bevel gears. The drive shaft **125** is driven by a main motor (not shown).

SCORING STATION

The first step in the formation of the record jacket is thereupon completed by the forming of the notches **34** in the upper side edge **118** and the lower side edge **120** of the first blank **32.** In order to form the glue flaps **44** at the upper and lower edges of the first blank **32** which will form the surfaces **152** to receive adhesive, a pair of score wheels **154** are disposed across the elongated carriage **46** of the bed of the machine **25.** The first blank **32** which has been notched is fed along the conveyor arrangement **84** to another conveyor arrangement **156** in spaced alignment relationship the first conveyor **84** such that the notched first blank **32** is moved between side guides **158** to a position beneath a pair of scoring wheels **162** which are rotatable against the first blank **32** along the length of the first blank **32** at a point inward of the upper and lower side edges.

The formation of score lines defines the area of the glue flaps **44** and since glue flaps **44** must be formed at the upper and lower sides of the blank **32,** two scoring arrangements **162** must be provided to form the upper score line **164** and lower score line **166.** Each scoring arrangement **162** is formed by two wheels. A first wheel **168** is positioned above a second wheel **170** much the same as at the notching station **100.** Each scoring arrangement **162** is provided with the male score forming

member **172** formed on the outer periphery **174** of the second wheel **170** below the first blank **32** and the female score member **176** provided above the first blank **32** on the outer periphery **178** of the first wheel **168.** Since the score lines **164, 166** run the entire length of the first blank **32** and the glue flaps **44** are defined by the scores **164, 166** and notches **34** and may easily fold upwardly along the score lines to form the folded glue flaps **44.** However, the function of the scores provided inwardly of the upper end and lower edges of the first blank **32** is to permit the folding upwardly and inwardly, back onto the main portion of the blank **32,** the guide flaps **44** which will retain their folded over characteristics to further permit the easy application of adhesive thereto.

The conveyor system **156** of the scoring station **150** is the same conveyor mechanism which moves the notched and scored first blank **32** along the longitudinal path of travel atop the elongated carriage **46** of the machine **25** and thereafter to the folding first station **200.**

It should be noted that the movement of the two wheels **168** and the two wheels **170** are synchronized together by means of shafts **180** which are operated from a drive means **125** which is well known to those skilled in the art.

SECOND FOLDING STATION

As shown in FIGS. **13** and **14** the first folding station **200** is comprised of a set of curved and formed metal members **202** which are positioned parallel to the longitudinal axis of the elongated carriage **46** of the machine **25.** Each member **202** is positioned in the path of the upper and lower side edges **118, 120** of the first blank **32.** Each member **202** provides a flat section **204** (at left in FIG. **13**) whereafter the outer section **206** of each member is bent gradually upwardly or downwardly as the member **202** extends along the elongated carriage **46** until the outer section **206** begins to bend the flap **44** toward the center of the first blank as shown in FIG. **14.** Therefore, as the notched scored first blank **32** moves against the fold forming metal strips **202,** the flaps **44** which are formed by the score lines **164, 166** and notches **34** fold upwardly and then inwardly toward the center of the first blank **32** and there are formed four glue flaps **44,** each of which is bent inwardly along the score lines **164, 166** of the first blank. As shown in FIG. **14,** the first blank **32** folds upwardly along the score line such that a rib **210** is formed and faces inwardly towards the center of the first blank **32.**

Because of the nature of the paperboard itself when the glue flaps **44** are formed and folded over inwardly toward the main body of the first blank **32** the flaps **44** have a tendency to rise upwardly over the board because the board has not been sufficiently broken for the flaps **44** to stay down in their folded condition. In order to insure that the flaps **44** stay down and do not unfold, a glue applying pressure roller **212** is provided on each side of the elongated carriage **46** and in alignment with the partially folded over glue flaps **44** to force the glued coated flaps downwardly under pressure so that each glue flap **44** may receive on its upwardly facing surface **214** a measure of adhesive **216.**

GLUING STATION

After the glue flaps **44** have been formed so that the glue surfaces **214** have been created and face upwardly from the conveyor belt arrangement **156** along which the notched, scored and folded first blank **32** has moved, an adhesive is applied to the upwardly facing surfaces **214** of the glue flaps **44.** As shown in FIGS. **15** and **16** the flaps **44** ride beneath the glue applying pressure rollers **212** and a measure of glue **216** is applied to the upwardly facing surface **214** of each flap from a glue pot **213.** The adhesive to be used may take any appropriate formulation well known to those skilled in the art and as such forms no part of the invention per se. It should be understood, however, that a means of adhesion is applied to the upwardly facing surfaces **214** of glue flaps **44** to form adhesion surfaces which will be hereinafter joined to a second paperboard blank **48.**

SECOND FEED STATION

At the opposite end of the elongated carriage **46** there is provided a second feeding station **300** at which is similar in structure to the first feeding station **50** and which feeds the second paperboard or second blank **48** onto a conveyor system **302** in synchronization with the movement of the first paperboard blank **32.** The second feeding station **300** is a mirror image of the first feeding station **50** and the second blank **48** is fed onto a conveyor chain link belt **304** having upwardly extending ears **306** thereon. The conveyor arrangement shown in FIG. **17** takes the form of a chain-link belt **304** in combination with a pair of rotating drive wheels **308.** The second feeding station **300** and drive wheels **308** thereof moves the second blank **48** onto the conveyor arrangement **302** such that the upwardly extending ears **306** engage the rear edge **310** of the second blank **48** and push the second blank **48** along the system until the leading edge **312** of the second blank **48** is urged between a pair of rollers **316** and then onto joiner drum **318.**

The size of the second blank **48** is important to note. Before second blanks **48** are stacked in the second feeding station **300** the blanks are precut to the approximate dimensions of the notched, scored and folded first blank **32.**

It is important to note that the movement of the second blank **48** is timed such that they will join at the proper moment at the joiner drum **318** so that the top surface **320** of the second blank **48** may be inverted on the joiner drum **318** to be the inner surfaces of the pockets to be formed in the roughly formed record jackets which immerge from the assembly station **350.**

ASSEMBLY STATION

It should be further noted that an additional gluing operation may be achieved at the assembly station **350** in the event it is decided that the finished record jacket shall provide only one pocket rather than two pockets. In such event a glue roller **352** with an adhesive applicator **354** is provided at the assembly station **350** and which applicator **354** is fed by means of a roller **356** which is partially emmersed in a glue well **358** and which well **358** may be fed manually or automatically with glue.

At the assembly station **350** the first blank **32** in its notched, scored and folded and glue applied condition and the second blank **48** are joined together. The first blank **32** with its glue flaps **44** having glue applied to the upwardly facing surfaces **214** is fed between a pair of guide elements **360** and is moved into position beneath the joiner drum **318** by means of a pair of rollers

362. Simultaneously, with the movement of the first blank 32 toward its position beneath and tangential to the outer periphery of the drum 318, the second blank 48 is being conveyed to a position 366 tangential to the outer periphery 364 of the joiner drum 318 at which point a gripping roller 370 engages the front edge 312 or the second blank 48 and the second blank 48 is thereafter rolled around the outer periphery 364 of the joiner drum 318 between the periphery 364 thereof and a curved guide plate 372. The construction of the joiner drum 318 is such as to provide for vacuum ports 365 in the periphery 364 of the hollow drum. The vacuum enters the drum interior via the hollow shaft 319 from a vacuum source not shown.

During the rotation of the joiner drum 318, the second blank 48 moves with the drum 318 by virtue of the vacuum through ports 365 in a counter-clockwise motion until the leading edge 312 of the second blank 48 and the leading edge 374 of the first blank meet and are both tangential to the peripherial surface of the joiner drum 180° from the original tangential position 366 of the second paperboard blank 48. At this point the leading edge 312 of the second blank 48 and the leading edge 374 of the first blank 32 are in approximate alignment while the side edges of the first blank 32 (in its folded condition) and the second blank 48 are in absolute alignment, one atop the other, as shown in FIG. 17, At the position where the two leading edges are joined, that is, the second blank 48 atop the first blank 32, and in registry therewith, the joined blanks are forced together by the pressure formed between the outer periphery 364 of the joiner drum 318 and the outer periphery 376 of a roller 378 disposed immediately beneath the joiner drum 318. As the joined blanks are moved between the drum 318 and roller 378 the adhesived surfaces will become glued together in alignment one with the other at their side edges and both blanks are thereafter further pressed together between additional rollers 380 and 382 so that all adhesion surfaces are joined under pressure and the roughly formed record jacket 384 is thus formed and thereafter moved to the transfer station 400.

The additional rollers 380 and 382 are positioned across the roughly formed jacket 384 so that additional pressure is applied over the adhesion surfaces. The additional rollers also act to accelerate the roughly formed jacket 384 onto the transfer station.

TRANSFER STATION

After the roughly formed jacket 384 is assembled through the action of the joiner drum 318, the roughly formed record jacket 384 follows the same travel path as the first blank 32 along the longitudinal axis of the elongated carriage onto the transfer station. The object of the transfer station is to change the direction of movement of the roughly joined record jacket 384. As the roughly joined jacket passes between the additional rollers 380, 382, it is moved into position above a pair of transversely operating chain link conveyor belts 402 against a stop member 404. The roughly formed jacket 384 is urged against the stop member 404 by means of upper brushes 405 and lower guide rollers 407 at which point the jacket 384 will come to rest momentarily until the movement of the transverse belt 402 takes the jacket 384 in the direction of the transversely operating chain link conveyor 402. As the roughly formed jacket now moves transversely to its original direction it moves down the leg 406 of T-shaped carriage portion and the roughly formed jacket is thereafter fed to the spine forming station 450.

SPINE FORMING STATION

As the roughly formed record jacket 384 is moved by the ears 408 on the transversely operating chain link belt 402, the roughly formed jacket 384 passes between a pair of guide members 452 and onto the spine forming station 450. As shown in FIGS. 20 and 21 the roughly formed jacket 384 moves from the transverse conveyor belt 402 to another conveyor belt 454 passing beneath a roller 456 which maintains the roughly formed jacket 384 in position on the conveyor belt 454 so that the same may smoothly travel between the guide members 452 into the spine forming station. In reality the spine forming station 450 and the trimming station 500 are in the same position on the transverse leg 406 of the T-shaped carriage portion.

In order to form the spine generally indicated by the reference numeral 456 there is provided a movable upper die support member 458 having disposed on its lower surface 460 a downwardly extending pair of dies 462. Immediately below the pair of dies 462 there is provided a male die 464 mounted to a fixed lower die support member 465. The cooperating dies 462, 464 form a detent 466 in the two blanks which formed the roughly formed jacket 384. The roughly formed jacket 384 is conveyed to a position between the upper and lower die until the jacket abuts a stop member 468. As shown in FIG. 20 the roughly formed jacket 384 is moved in position against the stop means 468 by means of a pair of ears 470 formed on the conveyor belt 454. The upper die support member 458 is adapted for reciprocating movement against a coil spring 472. The coil spring 472 is mounted around a guide post 473 secured at one end to the upper die support member 458 which passes through an aperture 475 in the lower die support member 465. At its opposite end guide post 473 is affixed to a movable plate 477. Mounted on the moveable plate 477 is a support block 479 which has an elongated shaft 481 passing therethrough. The outer ends of shaft 481 passes through slots in the transverse carriage and have guide blocks 483 affixed to their ends. In order to reciprocate the plate 477 a rotatable shaft 485 is provided with a cam member 487 at the end thereof to effect the reciprocating action of lower plate 477. Guide ways 489 insure the vertical movement of the guide blocks 483 and their associated members. When the roughly formed album jacket 384 is in proper position beneath the upper die support member 458 such that when the dies 462 are brought downwardly against the male die 464 by the operation of the movable plate 477, the movement forms the spine 456 in the roughly formed jackett 384. The formation of the spine 456 is followed by the sequential downward movement of the stop member 468 which is cam operated through the rotating cam arrangement 474. The movement of the cam arrangement 474 is related to the reciprocating movement of the upper die support member 458 so that when the upper die support member 458 is in its higher position the stop 468 is positioned as shown in FIG. 20 to act as a stop against the continued movement of a roughly formed record jacket 384 along the conveyor system 454. With the downward movement of the upper die support member 458 and the concurrent formation of the spine 456

through the action of the pair of dies **462** and the stationary male die **464,** the stop **468** is moved downwardly about the pivot point **476** permitting the spined record jacket **384** to move out from beneath the upper die support member **458** and permitting another roughly formed jacket **384** to move into position beneath the upper die support member **458.** In this manner, roughly formed record jackets **384** are continuously and synchronously moved into position beneath the upper die support member **458** to have the spine **456** formed in the roughly formed record jacket **384.**

TRIM STATION

Simultaneously, with the formation of the spine **456,** the leading and rear edges **312, 374** of the first and second blanks are trimmed as shown in FIG. **21.** It had been previously stated that the first blank **32** and the second blank **48** are joined at the joiner drum **318** at a position located between the joiner drum **318** and the roller **378.** In order to insure that the edges, both leading and rear, of the blanks are precisely in alignment, the edges are trimmed by means of the knife arrangement **502** connected to the upper die support member **458.** Once the leading and rear edges of the joined first and second blanks have been trimmed the record jacket is now complete except for the folding thereof.

SECOND FOLDING STATION

In order to fold the record jacket closed about the spine **456** which had been formed in the spine forming station **500** the completed but unfolded record jacket **384** is moved by the conveyor **454** toward the delivery end **26** of the machine **25.** As the record jacket moves toward the delivery end **26** a bar **552** is formed to engage the bottom of the right hand half (as viewed in FIGS. **1** and **21**) of the record jacket. As jacket **384** moves the bar **552** bends the aforementioned half of the jacket **384,** about the spine **356** onto the left-hand half of the jacket. In this manner, the completed and closed record jacket which comprises the final product **600** is brought to the delivery end **26.**

As previously indicated a motor, not shown, drives the main drive shaft **125** upon which are mounted bevel gears for all rollers, feed mechanisms and conveyors along the elongated carriage and transverse leg portion.

While in accordance with the patent status, a preferred embodiment has been shown and described in detail, the invention is not limited thereto or thereby.

I claim:

1. A machine for making record jackets having one or two pockets from two paperboard blanks comprising a "T" shaped frame being provided with an elongated carriage and a transverse leg extending therefrom, said elongated carriage having a longitudinal axis with an input at each end thereof and a delivery end on said transverse leg, a first feeding station at one input end of said elongated carriage for feeding a first paperboard blank in one direction along the longitudinal axis thereof, a second feeding station at the other input end of said elongated carriage for feeding a second paperboard blank toward the first paperboard blank, a notching station adjacent said first feeding station for cutting notches in said first paperboard blank, a scoring station adjacent said notching station for cutting score lines in said first paperboard blank, said notches and score lines defining a plurality of glue flaps, a first folding station adjacent said scoring station for folding said glue flaps into a predetermined position, a gluing station adjacent said folding station for applying an adhesive to said glue flaps, an assembly station disposed between said gluing station and said second feeding station for joining said second paperboard blank to said notched scored and folded first paperboard blank, a transfer station for directing the movement of said joined first and second paperboard blanks onto said transverse leg toward said delivery end thereof, a spining station adjacent said transfer station for forming a spine in said joined first and second paperboard blanks, a second folding station adjacent said spining station for folding said joined first and second paperboard blanks along said spine thereby forming a closed record jacket, said second folding station being positioned before said delivery end where said record jackets are removed, and conveyor means disposed in said elongated carriage and said transverse leg for moving the first and second paperboard blanks from station to station.

2. The machine according to claim **1** wherein said first feeding station, notching station, folding station, gluing station, assembly station and second feeding station are in alignment with respect each to the other along the longitudinal axis of said elongated carriage.

3. The machine according to claim **2** wherein first feeding station feeds said first paperboard blank in one direction along the longitudinal axis of said elongated carriage and said second feeding station feeds said second paperboard blank in the opposite direction.

4. The machine according to claim **3** wherein an optionally usable gluing station is provided at said assembly station for providing an adhesive applying means to preselected portions of said second paperboard blank.

5. The machine according to claim **4** wherein a trimming station is disposed between said spining station and said second folding station to trim off said record jacket excess material or uneven ends.

6. The machine according to claim **5** wherein said second paperboard blank is conveyed into said assembly station in a plane on said elongated carriage different from the plane of movement of said first paperboard blank.

7. The machine according to claim **6** wherein said assembly station comprises:-

a. guide elements mounted in said elongated carriage adjacent to said conveyor means and adapted to direct the travel of said first paperboard blank on said conveyor means from said gluing station;

b. a joiner drum having an outer perhiphery rotatably mounted on said elongated carriage, said joiner drum adapted to receive said first paperboard blank and adapted to receive said second paperboard blank travelling on said conveyor means from said second feeding station, said second paperboard blank being rolled on said outer periphery of said joiner drum and brought into superimposed relationship on said first paperboard blank; and

c. at least one roller mounted to said elongated carriage disposed immediately beneath said joiner drum and in spaced relationship therewith so that said first paperboard blank and said second paperboard blank are forced together as they pass between said at least one roller and said joiner drum.

8. The machine according to claim **7** further comprising:-

a. at least one gripper roller rotatably mounted to said elongated carriage in communication with said joiner drum adapted to urge said second paperboard blank against said outer periphery of said joiner drum;

b. vacuum ports formed in said outer periphery of said drum to permit said second paperboard blank to be releasably secured to said outer periphery by a vacuum; and

c. at least one guide plate mounted to said elongated carriage in spaced relationship from said joiner drum adapted to prevent said second paperboard blank from separating from said joiner drum as said joiner drum rotates.

9. The machine according to claim **8** wherein said at least one guide plate is a curved plate defining a curve substantially identical to said outer periphery of said joiner drum.

10. The machine according to claim **9** wherein said first paperboard blank is conveyed to a position beneath and tangential to said outer periphery of said joiner drum, said position being in the plane of feed of said first paperboard blank, said second paperboard blank is conveyed to a position tangential to said outer periphery of said joiner drum, said position being in the plane of feed of said second paperboard blank, the conveying of said first and second paperboard blanks being synchronized so that the said first paperboard blank arrives at said position beneath said joiner drum at the instant said second paperboard blank is being rolled around said joiner drum so that said first and second paperboard blanks are in registry one upon the other.

11. The machine according to claim **10** further comprising a pair of rollers, one of said rollers mounted on said elongated carriage in the plane of feed of said joined first and second paperboard blanks, said pair of rollers being spaced one from the other so that said first and second paperboard blanks are pressed toward each other as they pass therebetween to aid in joining the first and second paperboard blanks.

12. The machine according to claim **11** wherein said pair of rollers provide a further means of moving said joined together and glued first and second paperboard blanks to said transfer station.

13. The machine according to claim **12** wherein said transfer station comprises:

a. conveyor means in said transverse leg operating transversely to the longitudinal axis of said elongated carriage;

b. a stop member for stopping said joined first and second paperboard blanks from moving along said longitudinal axis; and

c. means for urging said joined first and second paperboard blanks against said stop member so that said joined first and second paperboard blanks are positioned on said transverse conveyor means.

14. The machine according to claim **13** wherein said urging means comprises:

a. at least one upper brush mounted to said elongated carriage;

b. at least one lower guide roller mounted to said elongated carriage beneath said at least one upper brush, said at least one upper brush and said at least one lower guide roller adapted to force said joined first and second paperboard blanks against said stop member.

15. The machine according to claim **14** wherein said transverse conveyor means comprises a pair of chain link conveyor belts.

16. The machine according to claim **15** further including:

a. a pair of ears on said pair of chain link transverse conveyor belts, said ears adopted to urge said joined first and second paperboard blanks along said transverse leg.

17. The machine according to claim **16** wherein said spine forming station comprises:

a. a conveyor means in communication with said transfer station transverse conveyor means;

b. a moveable upper die support member mounted from a reciprocating movement in said transverse leg, having a lower surface;

c. a pair of die downwardly extending from said lower surface;

d. a fixed lower die support mounted within said transverse leg; beneath said moveable upper die support member

e. a male die mounted to said fixed lower die support immediately below said pair of die; and

f. a stop member, moveably mounted in said transverse leg, said stop member being moveable to a position to act as a stop against the continued movement of said joined first and second paperboard blanks along said conveyor means to position said joined first and second paperboard blanks between said pair of die and said male die, said pair of die being brought to bear upon said joined first and second paperboard blanks as said moveable upper die support member moves downwardly to form a spine in said joined first and second paperboard blanks, said stop member adapted to move from the path of said joined first and second paperboard blanks after said spine is formed, to allow said joined first and second paperboard blanks to continue along said conveyor means.

18. The machine according to claim **17** further comprising:

a. a coil spring;

b. a guide post having two ends, one end of said guide post mounted to said upper die support member, said guide post passing through said lower die support;

c. a moveable plate mounted to the oopposite end of said guide post;

d. a support block mounted on said moveable plate;

e. an elongated shaft passing through said support block, said elongated shaft having two ends;

f. guide blocks mounted to said ends of said elongated shaft;

g. a rotatable shaft, said rotatable shaft having two ends each end passing through said transverse leg;

h. cam members mounted to said ends of said rotatable shaft in communication with said support block so that when said rotatable shaft rotates, said cam member effects reciprocating action of said lower plate, resulting in reciprocating action of said moveable upper die support member against said coil spring.

19. The machine according to claim **18** further comprising guide ways on said transverse leg to limit said guide blocks to vertical movement as said cam members rotate.

20. The machine according to claim **19** wherein said stop member is cam operated through a rotating cam arrangement, the movement of said rotating cam arrangement being related to said reciprocating movement of said moveable upper die support member so that when said moveable upper die support member is in its higher position said stop member acts as a stop against the continued movement of said joined first and second paperboard blanks along said conveyor means, and with the formation of said spine, said stop member is moved sequentially downwardly to permit said joined first and second paperboard blanks to move out from beneath said moveable upper die support member.

21. The machine according to claim **20** wherein said conveyor means comprises a chain link conveyor.

22. The machine according to claim **21** further including a pair of ears formed on said chain link conveyor, said ears adapted to urge said joined first and second paperboard blanks along said conveyor and to urge said joined first and second paperboard blanks against said stop member when said stop member is in position to stop the continued movement of said joined first and second paperboard blanks along said conveyor means.

23. The machine according to claim **22** wherein said record jacket excess material or uneven ends is trimmed off simultaneously with the formation of said spine.

24. The machine according to claim **23** wherein said excess jacket material or uneven ends are trimmed by means of a knife arrangement connected to said moveable upper die support member.

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