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J. H. MURCH

2,188,916

METHOD OF MAKING CONTAINER PARTS

Filed June 9, 1938

2 Sheets-Sheet 1

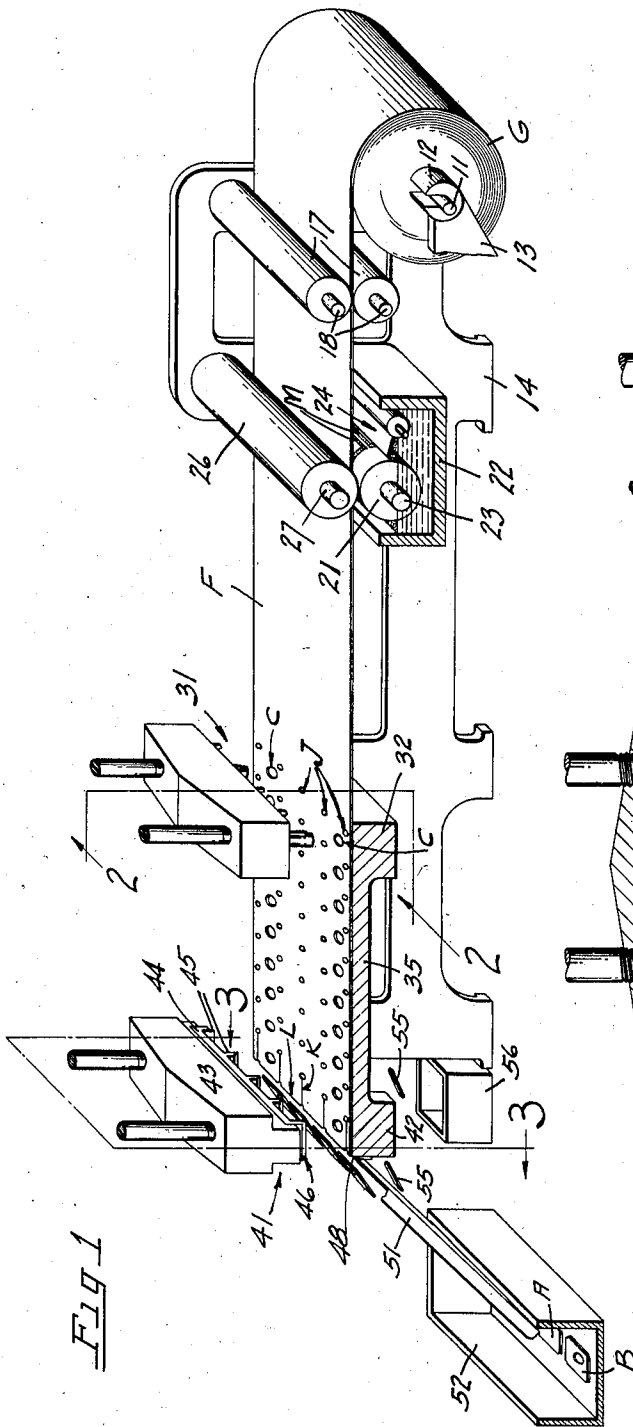
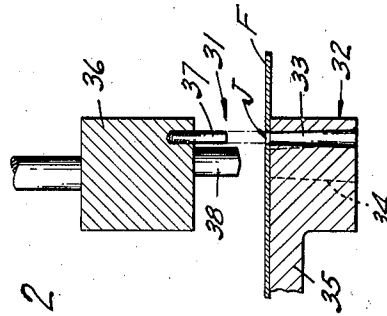
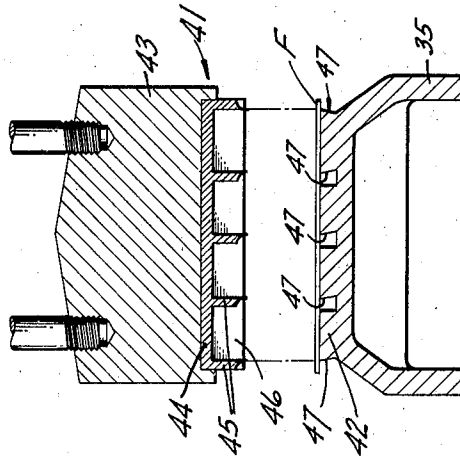
Fig 1

Fig. 2



Fl 3

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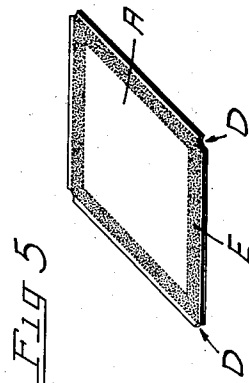
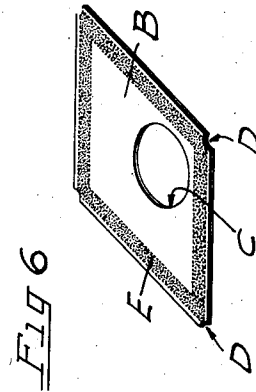
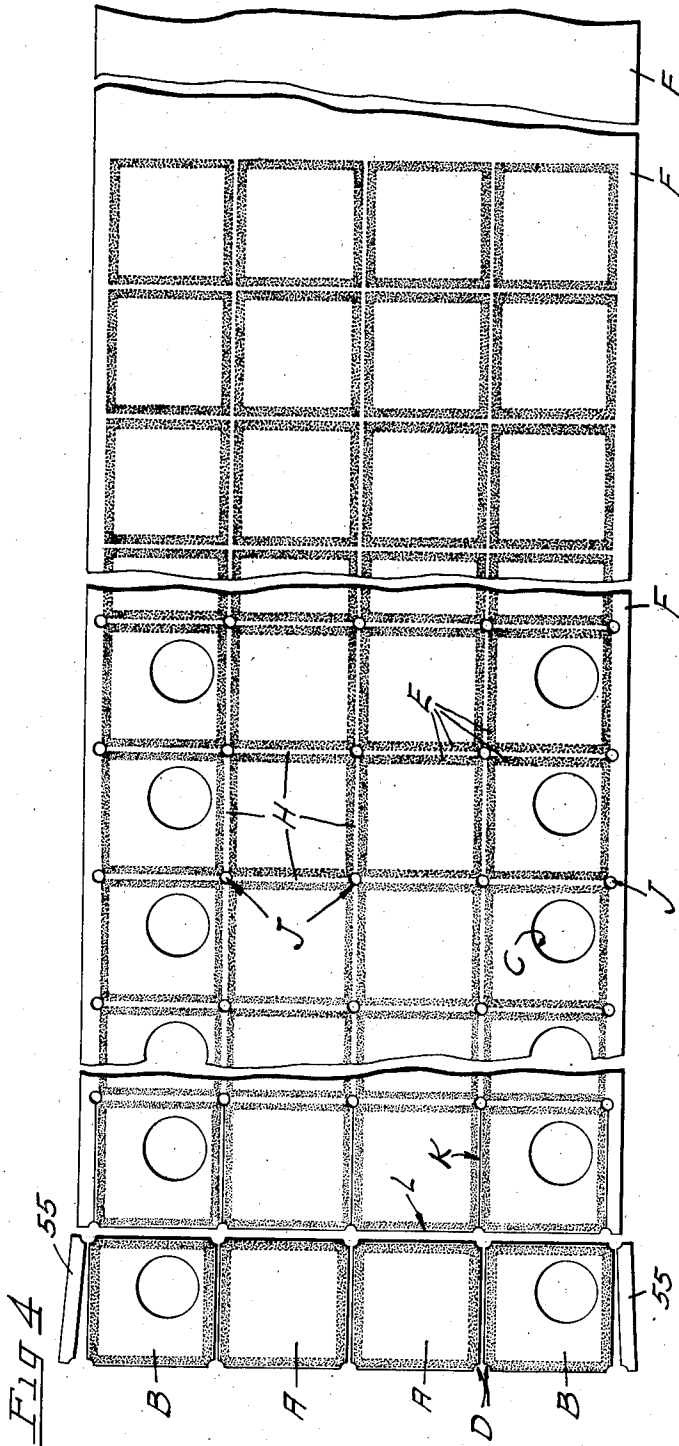
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METHOD OF MAKING CONTAINER PARTS

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2 Sheets-Sheet 2



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METHOD OF MAKING CONTAINER PARTS

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8 Claims. (Cl. 93—36)

The present invention relates to a method of producing container parts and the like and has particular reference to the making of angular container ends which are relieved at the corners to accommodate the body wall corner creases of a container body when assembled therewith.

An object of the invention is the provision of a method of making rectangular or other angular container parts such as can ends from sheet material which includes punching holes in the sheet in position to subsequently become the corners of the container ends and then slitting the sheet material between the holes to separate individual container parts.

A further object of the invention is the provision of a method of making container ends from a substantially continuous web of fibrous sheet material including the steps of applying a quick drying adhesive in a desired pattern, piercing the web and thence cutting relative to the applied adhesive patterns to produce container ends having the adhesive in the desired position.

Another object is the provision of such a method of making container ends having relieved corners wherein both bottom and top ends may be produced simultaneously and these ends may be different in character.

Yet another object is the provision of a method of making sharp angled container ends wherein there is simultaneously produced some of the ends with dispensing or other openings while other ends are blank, these different types of ends being made in a continuous and rapid manner.

Another object is the provision of a method of making rectangular container ends from a substantially continuous web which includes first punching holes in position to subsequently become the corners of the container ends, thence slitting the web longitudinally between adjacent holes to provide separated sections of the web and thence cutting the web laterally and across certain holes to completely sever individual ends having relieved corners.

Numerous other objects and advantages of the invention will be apparent as it is better understood from the following description, which, taken in connection with the accompanying drawings, discloses a preferred embodiment thereof.

Referring to the drawings:

Figure 1 is a perspective view of one form of apparatus which may be used in carrying out the steps of the instant method invention, parts of the apparatus being broken away, the view showing a web of sheet material in position as it is passed through the apparatus and also

showing cornered can ends produced therefrom;

Fig. 2 is an enlarged sectional detailed view taken substantially along a longitudinal plane indicated by the trace lines 2—2 in Fig. 1;

Fig. 3 is an enlarged transverse section taken substantially along a plane indicated by the trace lines 3—3 in Fig. 1;

Fig. 4 is an enlarged view of a web of material as it appears from the underside when operated on in the apparatus, illustrating the various method steps involved in producing the can ends shown at the left of the view, parts being broken away; and

Figs. 5 and 6 are enlarged perspective reverse or inverted views of two different forms of ends produced by the steps of the method invention.

As a preferred embodiment of the present invention the drawings illustrate a method of producing fibre or other blanks such as container or can ends of the character illustrated and described in the John M. Hothersall United States Patent 2,085,979, issued July 6, 1937, on "Container", although obviously other suitable container parts would be equally applicable.

There are preferably two types of such end members used in each container, one being a bottom indicated in the drawings by the letter A (Fig. 5) and the other a top as shown at B (Fig. 6). These end members when made for a rectangular can of the Hothersall type are the same size and shape but the top B is provided with a dispensing opening C.

Either top or bottom may be flat and its sharp corners are relieved by removal of sufficient stock to produce a small curved corner recess D. This corner construction accommodates the stock of the body wall corner creases when the can is made from fibrous material and is beaded or shouldered as shown in the Hothersall patent referred to above and this allows for more accurate assembly of the container parts.

One surface of the can end as herein exemplified carries a suitable quick drying adhesive which is so applied as to form a suitable pattern E before punching or slitting the end stock. This pattern preferably conforms to the shape of the end so that the adhesive will be disposed adjacent the outer marginal edges thereof and spaced inwardly a slight distance therefrom. It is against such a surface that the end edges of the can body extend and the adhesive forms a bond when the container is made up. The present invention does not include such assembly step and it is herein mentioned only to suggest one use of such adhesive.

A plurality of different can ends A and B are preferably produced at each operation and the operations are repeated in a continuous manner in order to suggest high speed production. The drawings shows four such end members acted on at each operation, i. e., two bottoms A and two tops B. For continuous production the ends are made up from a continuously advancing web F (Figs. 1 and 4) which may be of fibrous sheet material and which is continuously unwound from a supply roll G. The tops B are preferably produced from sections of the web adjacent the outer marginal portions and the bottom ends A come from the center of the web as will be more apparent as the description proceeds.

The adhesive patterns E are first applied to the moving web. The patterns for the type of can end now being considered come as hollow squares which are preferably arranged in rows extending transversely of the web as shown in Fig. 4. Each pattern is spaced equally from those adjacent and the sides of adjacent squares are separated by a narrow uncoated web portion H.

After application of the adhesive to the web the latter is pierced or punched out at the corners of the individual adhesive patterns. This piercing produces in the web a transverse line of holes J. Each hole is thus located at the intersection of uncoated web portions H. Simultaneously with the piercing action the dispensing opening C of the container tops B may be punched out. These dispensing openings necessarily are only in the top blanks and each opening is preferably located just inside of but adjacent to the inner corner of the marginal patterns although the exact arrangement is optional.

Piercing of the web F in producing the corner holes J and the dispensing openings C is followed by a cutting of the web around the edges of the adhesive pattern. This cutting is preferably done in two steps. The last end row of patterns in the web is first cut or slit longitudinally thereof, the slits extending from hole to hole between adjacent adhesive patterns in the row and along the outside edges of the two outer patterns. The lines of cut extend along the middle of the longitudinally disposed uncoated web portions H as longitudinal lines of severance K.

The four partially separated pattern blanks on the end of the web are then cut off in a transverse line of severance L which extends from one edge of the web to the other. The line of severance extends along the middle of the transverse uncoated web portions H and across the corner holes J.

This manner of cutting the web into and across the corner holes produces the curved corners D and gives smoother edges all around. The relieved corners allow space for folded corner stock of the can bodies to which the ends are subsequently attached and prevents the formation of undesired protuberances or the like at the corners and elsewhere which would interfere in properly assembling the finished end members with the other parts of the container particularly where fibre bodies having beads, shoulders, etc., are used. This transverse cutting action completes the formation of the container ends A and B (Figs. 5 and 6).

In the preferred form of apparatus illustrated in the drawings and adapted to carry out the method steps of the invention the roll G of fibrous material F is supported on a cross-bar 11 (Fig. 1). This cross-bar is carried in bearings

12 disposed in brackets 13 formed on a frame 14 which may be the main frame of the apparatus.

The web F of material is fed into the apparatus by a pair of feed rollers 17 which are disposed adjacent the roll G of material. The rollers are carried on cross-shafts 18 journaled in suitable bearings formed in the main frame 14. These feed rollers are continuously rotated in any suitable manner in time with the other moving parts of the apparatus.

The adhesive patterns E are applied to the moving web F by a rotating intaglio roller 21 which is disposed in a tank 22 of preferably quick drying adhesive located under the web and adjacent the feed rollers 17. The intaglio roller is carried on a cross-shaft 23 which is journaled in suitable bearings formed in the main frame 14. The roller is rotated in any suitable manner in time with the other moving parts of the apparatus. The rotating roller thus carries the adhesive up out of the tank.

A doctor 24 located in the tank 22 and bearing against the intaglio roller scrapes off all of the adhesive except that which is lodged in the intaglio or pattern recesses of the roller. It is this remaining adhesive which is applied as the pattern E to the web as the latter moves over the roller.

The web is pressed against the intaglio roller 21 during the application of the adhesive patterns thereto. This is effected by a pressure roller 26 which is disposed above the intaglio roller and which is rotated in any suitable manner in time therewith. The pressure roller is mounted on a cross-shaft 27 carried in suitable bearings formed in the main frame 14.

Piercing of the web to produce the corner holes J and the dispensing openings C is preferably done at the same time by a die mechanism 31 (see also Fig. 2) which is located in the path of travel of the moving web. The mechanism includes a stationary die 32 having suitable die recesses 33, 34. The die is formed in a bed plate 35 over which the moving web passes. This bed plate is secured in the main frame 14 in any suitable manner.

Above the die 32 there is located a punch head 36 which is mounted for vertical movement in the main frame 14. The punch head is raised and lowered in any suitable manner in time with the other moving parts of the apparatus. The punch head 36 carries a row of small diameter punches 37 and also a pair of larger diameter punches 38. These cooperate with the die recesses 33, 34 when the piercing and punching is done, the small diameter punches 37 producing the corner holes J and the larger punches 38 forming the dispensing openings C.

In making the ends herein shown where the tops B are cut from the outer marginal portions of the web, the larger punches 38 are accordingly located adjacent the ends of the punch head. Reciprocation of the punch head 36 is in exact timed relation with the passage of the web over the die 32 and therefore the cutting of the holes J and openings C in the web will be done in the proper place relative to the adhesive patterns E.

The cutting of the ends A, B from the web after the punching operation, is preferably done by a slitting and cutting mechanism 41 (Figs. 1 and 3) which is located adjacent the piercing mechanism 31. This cutting mechanism 41 includes a slitting or shearing die 42 which is formed as a part of the bed plate 35 and a slitting

or shearing head 43 the latter being movably mounted in the main frame 14 above the web which passes over the die. The shearing head is vertically reciprocated by any suitable means operating in time with the other moving parts of the apparatus and with the passage of the web over the bed plate.

The shearing head 43 carries a cutter 44 which is provided with a plurality of short spaced parallel cutting or slitting blades 45. These blades are disposed adjacent each other and extend in a row across the web. The blades are longitudinally arranged in parallelism with the path of travel of the web across the shearing die 42. The cutter is also provided with a single long shear blade 46 which extends transversely of the path of travel of the web. The slitting blades 45 cooperate with stationary slitting edges 47 formed in the die 42 and the shear blade 46 similarly co-acts with a stationary shearing edge 48 of the die.

On the downward stroke of the shearing head 43 the cutter 44 cuts through the web F where it rests on the die 42. The slitting blades 45 cut through or slit the web along the longitudinal lines K hereinbefore mentioned. On the same stroke the shear blade 46 cuts across the web along the line L. It will be understood that at the time this descent of the cutter 44 takes place the last row of pattern blanks in the end of the web extends out over the shear edge 48. This last cutting operation therefore severs the ends A and B from the end of the web and at the same stroke new lines K are made in the next row of pattern blanks. This row of slit patterns, as soon as the four completed ends fall off, becomes the end row in the web.

The completely severed ends A, B fall into a discharge chute 51 which is secured to the stationary die 42. The chute directs the ends into a receptacle 52. If desired the ends may be arranged in a stack or a stacking device may be installed at this position instead of the receptacle 52.

The marginal scrap pieces of the web indicated by the numeral 55 (Figs. 1 and 4) are cut off by the shear blade 46 at the same time the blade severs the ends from the web. These scrap pieces fall over the end edges of the die 42 and are preferably caught in suitable receivers 56 disposed on each side of the apparatus under the die mechanism 41.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description, and it will be apparent that various changes may be made in the steps of the process described and their order of accomplishment without departing from the spirit and scope of the invention or sacrificing all of its material advantages, the process hereinbefore described being merely a preferred embodiment thereof.

I claim:

1. A method of producing container parts from sheet material and with relieved corners, which comprises feeding the sheet material in a predetermined path of travel, punching a plurality of holes in predetermined position and in predetermined relationship in the material, and thence cutting with one operation along three sides of each part while joining adjacent holes, thereby producing a plurality of container parts each having a predetermined outline and having its corners relieved.

2. A method of producing container parts from

sheet material and with relieved corners which comprises feeding the sheet material in a predetermined path of travel, punching a plurality of holes in the material at places which will be the corners of the finished container part, and thence cutting with one operation along three sides of each part on lines which connect with adjacent holes thereby producing a plurality of container parts each having a predetermined outline and having its corners relieved.

3. A method of producing container parts from fibrous material and with relieved corners, which comprises feeding a continuous web of fibrous material through operating stations, punching a plurality of holes in a portion of the web while at one of said stations, said holes being in predetermined relationship within the material, and cutting with a single operation the punched portion of said web of material along three sides of each container part while at another operating station along lines which terminate in the holes thereby producing a plurality of fibrous container parts each having a predetermined outline and each having its corners relieved.

4. A method of producing container parts from sheet material and with relieved corners, which comprises applying an adhesive pattern to the sheet material while feeding the latter along a predetermined path of travel, punching a plurality of holes in a predetermined relationship to the outline of the adhesive pattern, and cutting the material with a single operation along three sides of each container part so that the lines of severance follow an outline of the adhesive pattern, each line terminating in adjacent holes thereby producing a plurality of container parts, the marginal portions of each of which carry adhesive and the corners of which are relieved.

5. A method of producing container parts from fibrous material and with relieved corners, which comprises feeding the fibrous material along a predetermined path of travel, punching a plurality of holes in the material at places which will be the corners of the finished container parts, punching a discharge opening in the material relative to said holes, and thence cutting the material with a single operation along three sides of each container part on lines which connect with and which terminate in adjacent holes, thereby producing a plurality of fibrous container parts each having a discharge opening within a predetermined outline and a part having its corners relieved.

6. A method of simultaneously producing different container ends from fibrous material, each end having relieved corners, which comprises feeding the fibrous material along a predetermined path of travel, punching a plurality of rows of spaced holes in the material, forming a discharge opening in the material between adjacent rows of holes and in a predetermined position, cutting the material along lines of severance which extend from the holes of one row into the oppositely disposed holes of another row, and simultaneously cutting the material at an angle to said lines of severance and along and through a row of holes, thereby producing a plurality of separate container ends each being simultaneously cut along three sides thereof and each having the same outline with the sharp corners removed but only some of said container ends having discharge openings.

7. A method of producing fibrous container

ends having relieved corners, which comprises feeding a continuous web of fibrous material through a plurality of operating stations, applying a plurality of rows of adhesive patterns to a portion of the web while at one station, punching a plurality of holes in the web while at another station, said holes bearing a predetermined relation to said patterns, simultaneously slitting the punched portion of the web at a third station along three sides of each container end on lines which terminate in said holes to set apart individual patterns in the end of said web and simultaneously severing the separated patterns from the web by cutting along lines which terminate in the holes of adjacent rows to provide a plurality of separate container ends each having a predetermined outline and relieved corners and also having the outer edges bounded with adhesive.

8. A method of producing fibrous container ends having relieved corners, which comprises feeding a sheet of fibrous material along a predetermined path of travel, applying to said material a plurality of adhesive patterns each spaced apart and separated by uncoated portions of the material, punching a plurality of holes in predetermined position and within the uncoated portions between patterns, and cutting the material in a single operation along three sides of each container end on lines of severance which extend from one hole to another and within said uncoated portions, thereby producing a plurality of separate container ends of predetermined outline, each bearing a single adhesive pattern and each having its sharp corners removed.

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