March 12, 1940. M. E. WIDELL 2,192,950

CAN BODY MAKER

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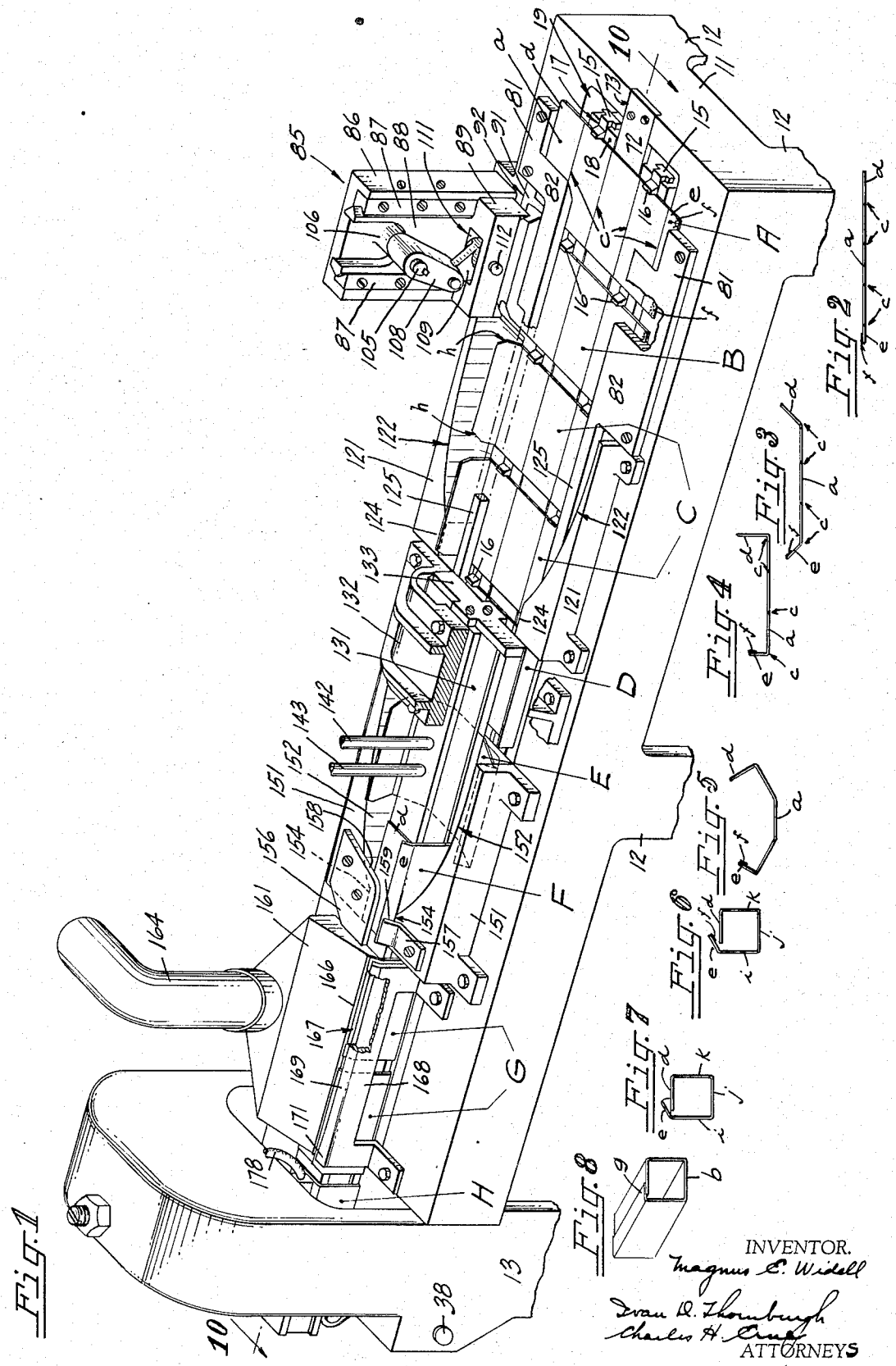


Fig. 1

Fig. 2

Fig. 3

Fig. 4

Fig. 5

Fig. 6

Fig. 7

Fig. 8

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CAN BODY MAKER

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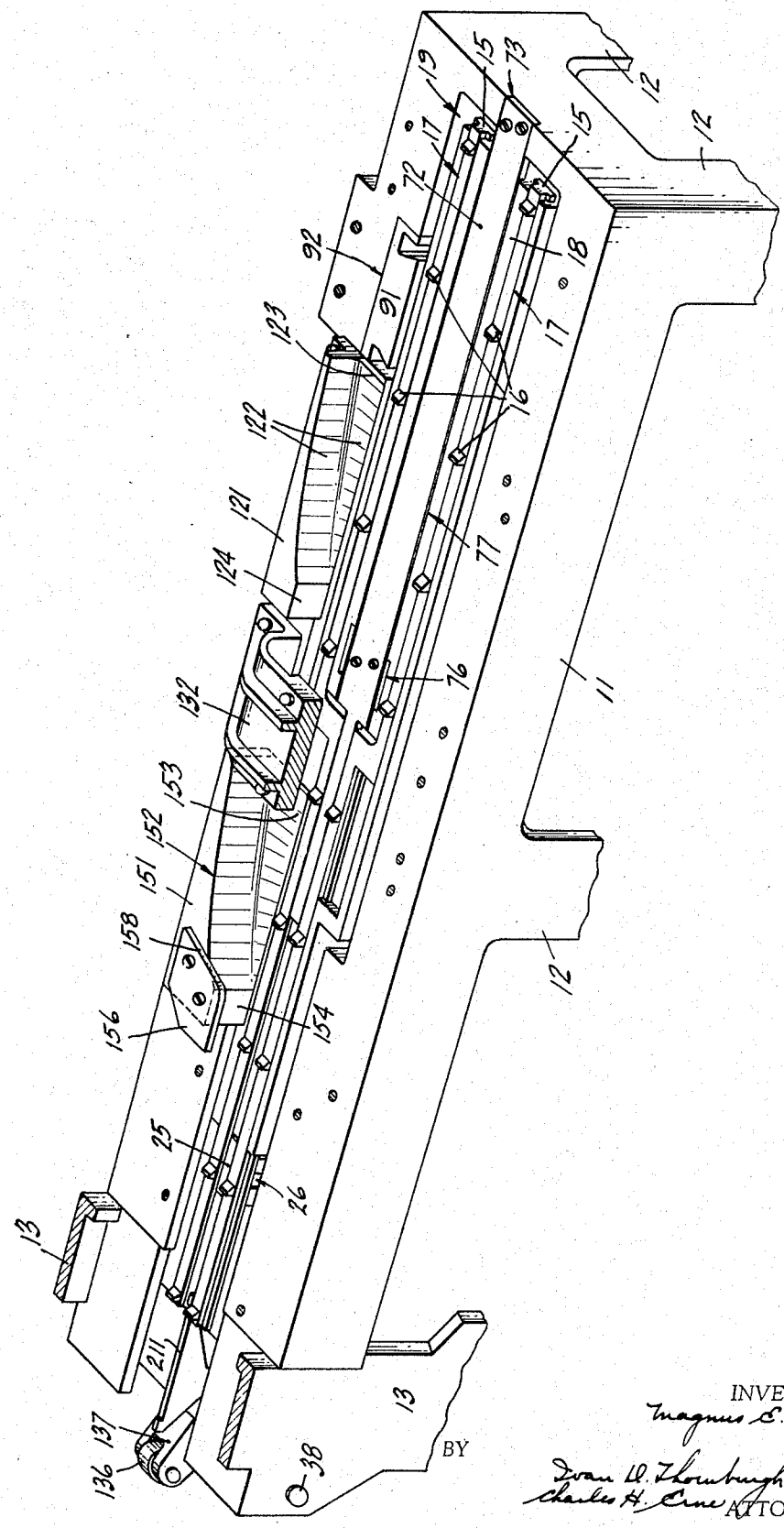


Fig. 8

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CAN BODY MAKER

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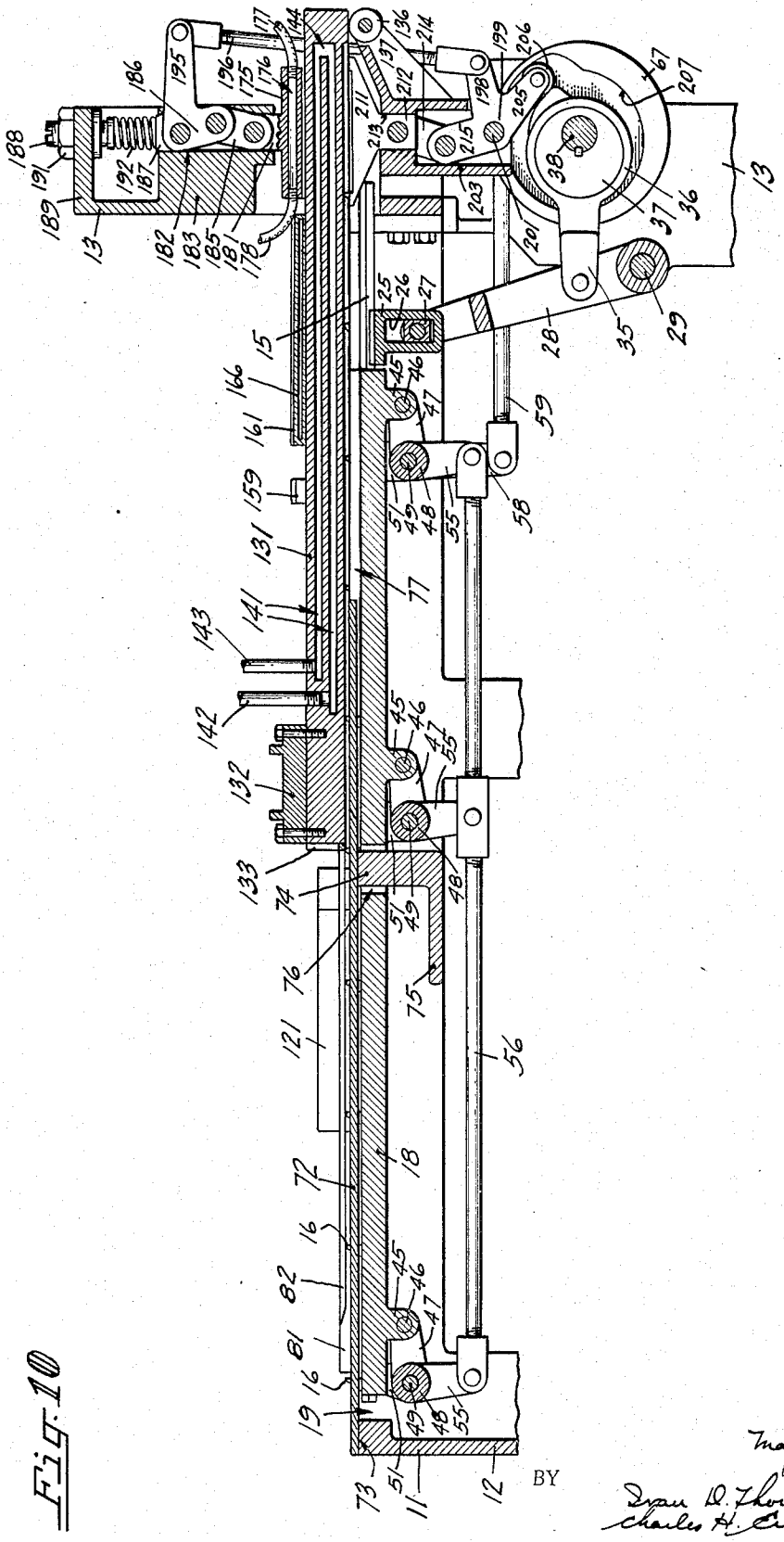


Fig. 10

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CAN BODY MAKER

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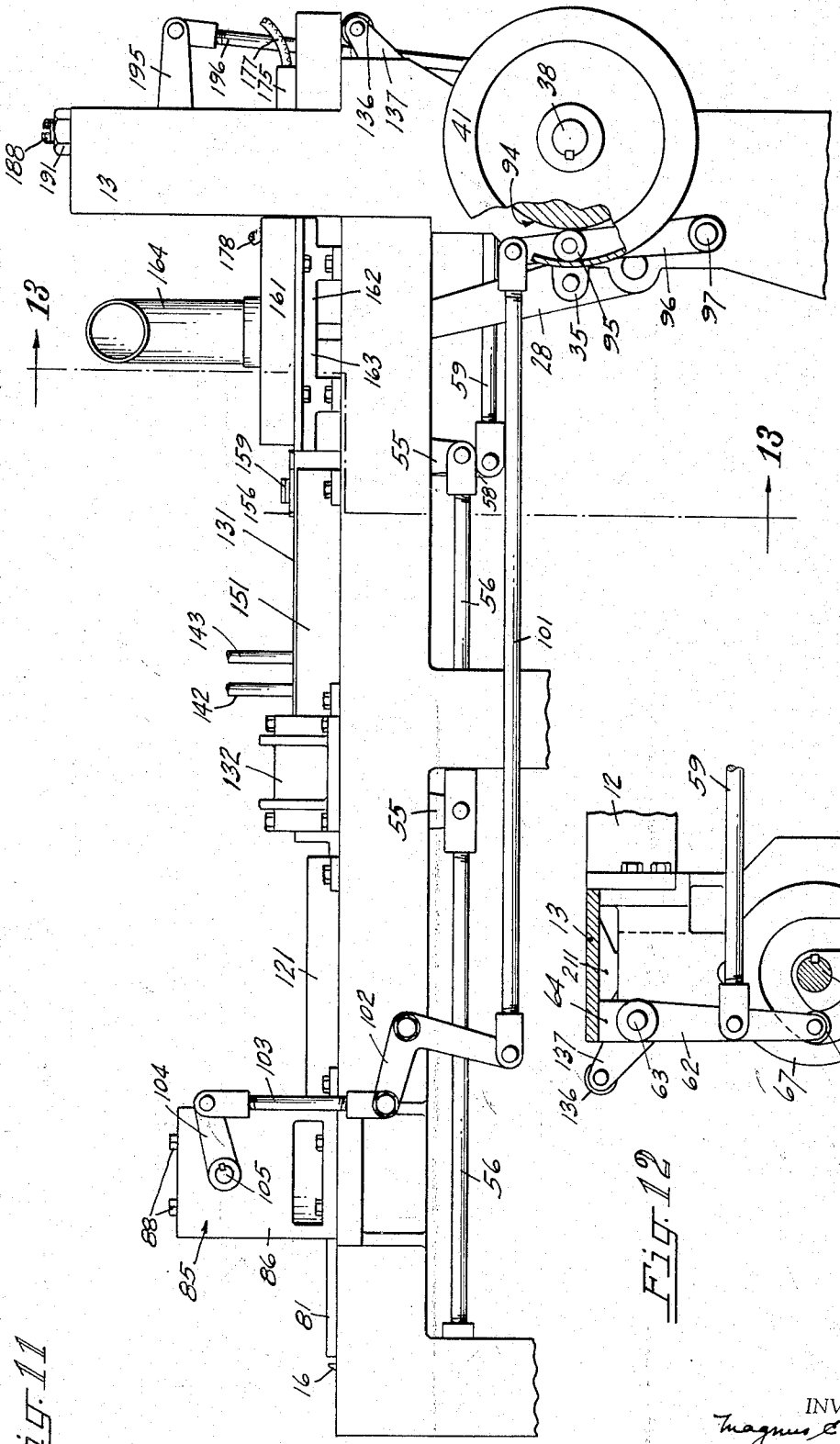


Fig. 11

Fig. 12

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CAN BODY MAKER

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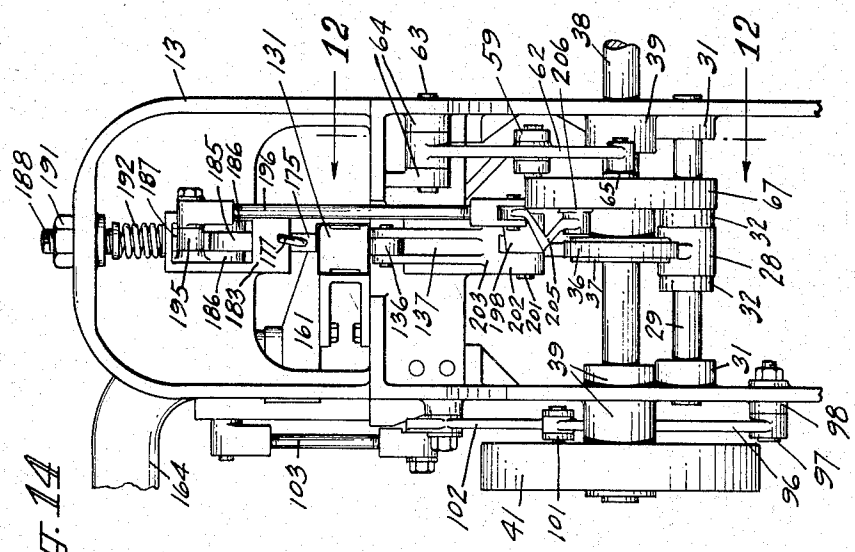


Fig. 14

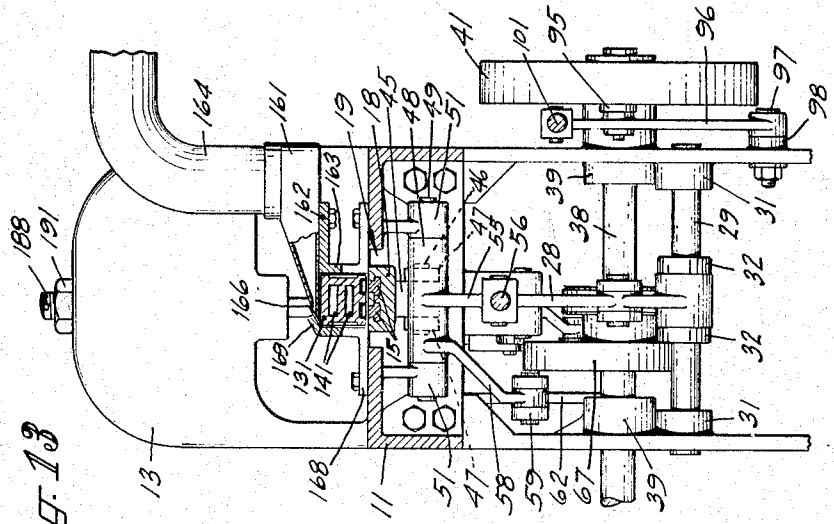


Fig. 13

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CAN BODY MAKER

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Application July 29, 1938, Serial No. 222,052

9 Claims. (Cl. 93—52)

The present invention relates to can body making machines and has particular reference to producing fibre can bodies from flat blanks which are progressively bent into can body shape, the side seam edges of the blank being incorporated in a side seam bonded with a thermoplastic adhesive.

An object of the invention is the provision of a can body making machine wherein flat fibre blanks carrying thermoplastic adhesive along at least one side seam edge are progressively formed into can body shape and their side seam edges bonded together by the adhesive carried on the blank.

Another object is the provision of such a machine wherein the blanks to be formed into can bodies carry a dried thermoplastic adhesive which is heated and reduced to a tacky mass during the formation of the can body and is incorporated in the side seam so that the body will be properly held together.

Another object is the provision of a machine of this character wherein flat and creased can body blanks are progressively bent along their creases while folding the sides of the body into proper position and while bringing their side seam portions into overlapping relation for embodiment in a side seam bonded with a heated thermoplastic adhesive.

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 a can body making machine embodying the present invention, parts being broken away;

Figs. 2 to 8, inclusive, are enlarged transverse sectional views of the work produced in the machine, Fig. 2 illustrating a can body blank to be operated on, Fig. 8 showing the finished can body made from the blank, and Figs. 3 to 7, inclusive, showing the intervening steps of transforming the blank into a body;

Fig. 9 is a perspective view of the bed of the machine with parts broken away;

Fig. 10 is a sectional view taken substantially along the line 10—10 in Fig. 1;

Fig. 11 is a longitudinal elevation of the machine with parts broken away;

Fig. 12 is a sectional detail taken substantially along the line 12—12 in Fig. 14;

Fig. 13 is a transverse section taken substantially along the broken line 13—13 in Fig. 11; and

Fig. 14 is an end elevation of the machine as viewed from the right in Fig. 11.

As a preferred embodiment of the instant invention the drawings illustrate a can body making machine in which flat blanks *a* (Figs. 1 and 9) preferably of fibrous material are moved successively past a plurality of working stations which form the blanks into tubular can bodies *b* (Fig. 8). In the present case the can bodies are rectangular in cross-section, the forming of the bodies being effected by progressively folding or bending the blanks along preformed creases *c* (Fig. 1) which have been previously produced in the blanks by suitable means not forming any part of the present invention.

The creases preferably extend parallel with short edges *d*, *e* of the blank, these edges and the marginal portions adjacent them being referred to hereinafter as the side seam edges. Edge *e* carries a band of dried thermoplastic adhesive *f* which has been previously applied by mechanism not involved herein. This band *f* when heated bonds the side seam edges into a tight body side seam *g* when the edges are brought together during the body forming operations.

The creased and adhesive banded blanks *a* are introduced into the machine in any suitable manner at a blank receiving station A (Fig. 1). The blank enters this station with its creased surface, i. e., the surface that will be the interior of the body, upward and the creases extending longitudinally of the machine. In this relative position the blank is advanced along a straight line path of travel from station to station in a step by step movement, the blank coming to a full stop at each station.

The first stepped movement advances the blank from the receiving station A to a notching station B. Here the corners are cut-off of the uncoated side seam edge *d* as shown at *h* in Fig. 1.

The next two stepped movements advance the notched blank through a double forming station C. At this station the blank is progressively folded along the two outer creases *c*. The blank is first bent as shown in Fig. 3 and secondly as shown in Fig. 4. This bends the side seam edges *d*, *e* into a vertical position. The next station indicated by the letter D is an idle station.

After passing the idle station D the blank is advanced in two more stepped movements through auxiliary forming stations E, F. In these stations the blank is progressively folded along the two inner creases *c* bringing the blank first into a form as shown in Fig. 5, this being at E and then into that shown in Fig. 6 which is at

F. This produces sides *i*, *j*, *k* for the body. This latter form is substantially the shape of the desired body, the sides of the body being now in proper position and the adhesive coated side seam edge *e* overlapping its mating edge *d* ready for embodiment in the side seam. When the side seam is finally completed, the edge portions *d*, *e* of the blank will be combined to provide the fourth side of the body.

The next two stepped movements advance the formed body through a heating station G where the thermoplastic adhesive *f* on the side seam edge *e* of the body is melted sufficiently to reduce it into a tacky mass. This is done by a blast of hot air which is directed against the adhesive. With the adhesive thus tacky, the body is moved out of the heating station G and the overlapping side seam edge *e* is then pressed down against its mating edge *d* while the body advances.

The body passes directly into a bumping station H where the overlapping and adhering side seam edges are tightly pressed together thereby producing the finished side seam *g* which holds the body together. This completes the body forming operation and the body is then discharged from the machine to any suitable place of disposal.

The various operating parts of the machine are carried on a horizontal frame **11** having legs **12**. One end of the frame is bolted to an upright auxiliary frame **13**.

The step by step movement of the body blanks *a* through the machine is effected by a feeding device which includes a pair of parallel feed bars **15** (Figs. 1, 9, 10 and 13). These feed bars extend nearly the full length of the machine and are provided with spaced feed dogs **16**. The feed bars are carried in slideways **17** formed in a vertically movable table **18** disposed in an opening **19** provided in the top of the frame **11**.

Each feed bar **15** is set inwardly for approximately one half of its length as best shown in Fig. 9 thus bringing the feed dogs in these portions of the feed bars, transversely closer together so that they can better engage the blank after its outer portions *i* and *j* have been folded into body shape. In like manner the slideways **17** are set inwardly to properly guide these set-in portions of the feed bars.

The feed bars **15** are reciprocated in unison in the slideways **17** by eccentric action. For this purpose the set-in ends of the feed bars are tied together by a spacer block **25** (Fig. 10) having a vertical slot **26** in which a slide block **27** operates. The slide block is secured to a bifurcated end of a rocker lever **28**. The lever rocks on a stationary shaft **29** which is carried in bearings **31** (see also Figs. 13 and 14) formed in the auxiliary frame **13**. Collars **32** secured to the shaft retain the rocker lever against transverse displacement.

Intermediate its length the rocker lever is secured to an eccentric arm **35** (Fig. 10) having an eccentric ring **36** which surrounds an eccentric **37** keyed to a main driving shaft **38**. The driving shaft is journaled in bearings **39** (Figs. 13 and 14) formed in the auxiliary frame **13**. This shaft is rotated in any suitable manner as by a drive belt and to allow for such a drive one end of the shaft carries a fly wheel **41**.

As the main driving shaft **38** rotates, the eccentric **37** rocks the lever **28** and hence reciprocates the feed bars **15** first on a forward or feeding stroke and secondly on a backward or return stroke. On the forward stroke of the feed bars the feed dogs **16** engage behind a blank *a* introduced into the machine at the receiving station A (see Fig. 1) and advance the blank one step into the notching station B as already suggested. During this travel of the blank it is supported over the top of the movable table **18**.

The movable table **18** is mounted for vertical movement within the opening **19** of the frame **11**. In its normal or raised position the table is disposed with its top surface flush with the top of the frame **11**. It is in this raised position when the body blanks are being advanced. However, when the feed bars **15** reach the end of their forward stroke the table is lowered to its lowermost position.

The table thereupon carries the feed bars **15** and their dogs **16** below the top surface of the frame thus disengaging the feed dogs from the advanced blanks A or can body parts. While the table is in this lowered position the eccentric **37** slides the feed bars back along their return stroke bringing them to their original position.

It is not until this return position is reached that the table is again raised to its original elevated position carrying the feed bars and dogs up into feeding position ready for a new blank *a* which may be introduced into the machine and ready for further feeding of the various blank and can parts. In this manner the feed dogs **16** spaced along the lengths of the feed bars, on this return stroke are moved away from any contact with the blanks which have been advanced to their proper stations on the forward stroke.

The vertical movement of the table **18** is effected by cam action transmitted to the table by a series of links and levers which are connected to a plurality of bearing lugs **45** (Figs. 10 and 13) formed on the bottom of the table. There are preferably three of these lugs spaced along the length of the table and each lug carries a pivot pin **46**. The end of each pivot pin is secured in a substantially horizontal leg **47** of an associated bell crank lever **48**. There are thus three of these bell crank levers to correspond with the three lugs **45**. Each lever **48** is mounted on a pivot shaft **49** carried in bearings **51** which depend from the top wall section of the frame **11**.

The bell crank levers **48** are also provided with substantially vertical legs **55** which are tied together by a long connecting rod **56**. The bell crank lever nearest the auxiliary frame **13**, i. e., the lever at the right in Fig. 10, is further provided with an arm **58** (see Fig. 13) which is secured to one end of a short connecting rod **59**. The opposite end of this rod is secured to a cam lever **62** at an intermediate place. Cam lever **62** is mounted on a pivot pin **63** (see also Fig. 12) carried in bearings **64** formed in the auxiliary frame **13**.

The free end of the lever carries a cam roller **65** which operates in a cam groove **66** formed in a double cam **67** mounted on the main driving shaft **38**. Thus as the main driving shaft revolves, the cam **67** directly reciprocates the long connecting rod **56** and thereby rocks the several bell crank levers in unison. It is this movement that lowers and raises the movable table **18**.

During advancement of the blanks *a* the latter are supported along their side seam or outside edges *d*, *e*, by the top wall section of the frame **11** and along their middle portions by a flat support bar **72** (Figs. 1, 9 and 10). The outer end of the bar is secured in a wide groove **73** formed

in the top wall section of the frame 11 adjacent the blank receiving station A.

Intermediate its length the bar 72 is secured to the top of a post 74 formed on a transverse web 75 of the frame 11. The post extends up through a clearance opening 76 provided in the table 18. The inner end of the support bar is free. Throughout its entire length the top of the table 18 is formed with a wide clearance groove 77 which permits the table to be raised without any interference and flush with the top of the flat bar 72 and the top of the frame 11 when the table is in normal position.

While the blanks are advanced along the top of the frame 11 and the support bar 72 they are maintained in their longitudinal line of travel by guide plates 81. These plates are secured to the top of the frame 11 adjacent the path of travel of the blank side seam edges *d, e*. Each plate is formed with an extension 82 which overlaps the blank at stations A and B and thereby prevents vertical displacement of the blank. At station A the extensions are cut away and beveled at their entrance ends. This facilitates introduction of the blank into position on the feed bars 15.

At the notching station B there is provided a cutting or notching device 85 (Figs. 1 and 11) which is located at one side only and is adjacent the path of travel of the uncoated side seam edge *d* of the blank. The notching device includes a stationary housing 86 having spaced vertically disposed gibs 87 in which a slide 88 operates. The housing is bolted to the top of the frame 11. The slide is formed with a die head 89 which when performing the notching operation is adapted to move down into a suitable die 91 seated in a recess 92 formed in the frame 11. It is these die members which cut off the corners *h* of the uncoated side seam edge *d* of the blank as hereinbefore described.

Movement of the slide 88 in its guideways is effected by a cam groove 94 (Fig. 11) which is formed in the inner face of the fly wheel 41 carried on the main drive shaft 38. The cam groove operates in connection with a cam roller 95 which is carried on a lever 96 mounted on a stud 97 secured in a boss 98 (see also Fig. 13) formed on the auxiliary frame 13. Rotation of the fly wheel therefore rocks the lever 96 in time with the other moving parts of the machine and in time with the advancement of the blanks along the top of the frame 11.

The free end of the lever 96 is secured to a connecting rod 101, the opposite end of which connects with one leg of a bell crank lever 102. Lever 102 is pivotally mounted on the side of the frame 11 adjacent the notching device 85. The other leg of the bell crank lever 102 is connected by a link 103 to an arm 104 mounted on a short shaft 105 carried in a bearing 106 (see Fig. 1) formed in the notching device housing 86.

Adjacent the inner end of the bearing 106 the shaft 105 carries a toggle arm 108 which connects with an auxiliary toggle arm 109 disposed in a recess 111 in the die head 89. The auxiliary toggle arm 109 is mounted on a pin 112 carried in the head. It is this mechanism which moves the die head 89 down into the die 91 at the proper time when a blank *a* is positioned at the station B and it is then that the corner notches *h* are produced.

The first folding operation performed on the notched blank to produce the shape of Fig. 3 bends the blank along the two outer creases *c*. This is effected by a pair of stationary folding guides 121 (Figs. 1, 9 and 10). These guides are bolted to the top wall section of the frame 11 and extend forward of the notching station B, one on each side of the path of travel of the blank. Each guide is formed with a curved inner surface 122 which slopes upwardly and inwardly from a substantially flat portion 123 adjacent its entrance end to a vertical wall termination 124 at its discharge end.

As a notched blank *a* is advanced by the feed bars 15 from the notching station B into and through the folding station C, the first stepped movement slides the side seam edges *d, e* of the blank over the top of the flat portions 123 of the guides 121, the edges of the blank engaging against the curved portions 122. It is this action which partially bends the blank along the outer creases *c*, the folded portions of the blank extending out at an angle as shown in Fig. 3, the blank having advanced only part way along the guides 121.

During this advancement a preferably square and sharp cornered rod extension 125 of the guide plates 81 serves as an anvil along which the blank is bent as it moves forward. The outer edges of these rod sections are in alignment with and just above the outer creases *c* of the blank. This facilitates the bending action. These rods extend along the entire length of the bending or folding guides 121.

On the second stepped movement through station C the blank further advances along the curved sections 122 of the folding guides and the angularly disposed portions of the blank are bent into the vertical or upright position of Fig. 4. The final upright position of the edges *d, e* is brought about when the blank edges pass off of the curved sections 122 and enter between the vertical portions 124 of the guides.

The folded blank next advances into the idle station D where it is brought under a forming horn 131 which extends throughout the remainder of the length of the machine. This horn is square in cross section for the present embodiment or shape of the can body being formed. In width the horn is the same dimension as the space between the two inner creases *c* of the body blank. It is around this horn that the blank is now folded along these inner creases.

The end of the horn at station D is suspended from a U-shaped bracket 132 which is bolted to the top of the frame 11. This end of the horn carries a plate 133 which supports the discharge ends of the anvil rod extension 125. The opposite end of the horn is supported adjacent the bumping station H on a roller 136 (Figs. 9, 10 and 14) which is carried in a bracket 137 formed on the auxiliary frame 13. The horn merely rests on the roller and thus permits a can body *b* when completely formed to be discharged from the horn the side wall *j* of the body passing between the horn and the roller.

The horn is preferably maintained at an even temperature by circulating a fluid cooling medium therethrough. For this purpose the horn is provided with a pair of horizontal channels 141 (Figs. 10 and 13). Adjacent the horn supporting bracket 132 the lower channel communicates with a fluid inlet pipe 142 which is threaded into the top of the horn. The upper channel communicates with a fluid outlet pipe 143 which is threaded into the horn adjacent the pipe 142. At the discharge end of the horn the upper and lower channels are connected by a short vertical channel 144.

Further bending of the body blank this time around the horn and along its inner creases *c* is effected by auxiliary folding guides **151** (Figs. 1 and 9) which are disposed on opposite sides of the horn **131** and which are secured to the top of the frame **11**. This begins at the station E and extends into station F. These auxiliary folding guides are similar to the folding guides **121** but are spaced transversely nearer to each other so that the folding action on the blank will wrap the latter around the horn.

The auxiliary folding guides **151** are formed with curved inner surfaces **152** which have substantially horizontal portions **153** adjacent their entrance ends so that the moving blank will ride up onto them and come into engagement with the more curved portions. At the opposite ends of the guides the curved surfaces terminate in flat vertical portions **154** which are parallel with and closely spaced from the sides of the horn **131**.

During the first stepped advancement of the partially formed body blank through the auxiliary folding station E the guides **151** partly fold the blank along its inner creases *c* until it is bent into the shape shown in Fig. 5. Only the central side *j* is next to the horn at this stage. This action is followed by a second stepped movement this time in station F during which movement the blank is further bent at the inner creases *c*. This wraps the three sides *i*, *j*, *k* of the folded blank around the horn **131**. During this second step the side seam edge *d* is brought down on the horn and the edge *e* comes into overlapping position above the edge *d*. The blank now has the approximate shape of the desired body as shown in Fig. 6.

Overlapping of the side seam edges of the blank is effected by a flat plate **156** (Figs. 1 and 9) and by a cooperating plate **157** which positions the edge *e*. The flat plate **156** is secured to the top of the auxiliary folding guide **151** on the far side of the machine as viewed in Fig. 1 and is provided with a horizontal cam edge **158** which overlaps or rather overhangs the horn **131**. The plate **157** is secured to the opposite guide **151** and is formed with an overhanging and upwardly sloping cam surface **159**. Plate **156** is positioned so that its cam edge **158** is in advance of the cam surface **159** of plate **157**.

The uncoated side seam portion *d* of the advancing partially formed can body first engages the cam edge **158** of the plate **156** and is accordingly laid down flat against the top of the horn. This action is readily effected since the bending takes place along the outer crease *c* which has already been folded in station C as hereinbefore explained. Continued advancement of the body along the horn next brings the adhesive coated side seam portion *e* into engagement with the cam surface **159** of plate **157**. This cam surface partially bends the blank along its other previously folded outer crease *c*, thus positioning the portion *e* in overlapping relation with the laid down portion *d* but holding it separated and at an angle thereto. The side seam edges are retained in this position for further continued advancement into the next station G where the adhesive *f* is heated.

Heating of the adhesive *f* on the side seam edge *e* is preferably brought about by a blast of heated air ejected from a hood **161** (Figs. 1 and 13) positioned directly over the forming horn **131**. The hood is supported on a bracket **162** disposed adjacent the horn and secured to the top of the frame **11**. A vertical leg **163** of the bracket holds the body against the horn as the body advances therealong. Heated air is conveyed to the hood **161** from any suitable source of supply by a pipe **164** which is attached to the hood.

The hood **161** transversely is shaped with a substantially triangular cross section which projects over the horn, the vertex of the triangle terminating in a nozzle head **166** (see also Fig. 10) having longitudinal slots **167** formed therein. The nozzle head is thus located at the near side edge of the forming horn, as viewed in Fig. 1. The adhesive coated side seam edge *e* of the advancing partially formed body passes directly over the slots of the nozzle head at the station G. A bracket **168** having an inclined shoulder **169** similar to the cam surface **159** on plate **157** keeps the coated side seam edge in proper position as it passes the nozzle head **166**.

The heating station G extends for two successive stepped advancements of the body and during such movements and also during the intermediate pause the hot air is playing on the adhesive strip. The body then moves into the bumping station H. During its travel from station G to station H, the heated side seam edge *e* is turned down flat into engagement with the already laid down uncoated side seam edge *d*. This turning down is done by the shoulder **169** which at its discharge end extends beyond the hood **161** and curves downwardly in a substantially flat shoe **171** (Fig. 1).

The bumping station H includes a vertically movable hollow hammer **175** (Figs. 10 and 14) which is located over the forming horn **131** just above the place where the side seam will be located when the advancing partially formed body is brought to a stop at this station. The hammer is preferably cooled by a fluid cooling medium which is circulated through a channel **176** formed therein. Circulation of the cooling medium is maintained through an inlet pipe **177** and an outlet pipe **178** threaded into the hammer and communicating with the channel.

The hammer **175** is provided with an upwardly extending stem **181** which slides in a guideway **182** formed in an extension **183** of the auxiliary frame **13**. The stem is connected to a lower toggle link **185** which in turn is pivotally connected to an upper toggle link **186**. The upper toggle link is pivoted to a block **187** which slides above the stem **181** in the guideway **182**.

The block is provided with a vertical shank **188** which extends up through a web **189** formed at the top of the auxiliary frame **13**. The shank extends above the web and is held in position by a nut **191** which is threaded onto the shank end. A compression spring **192** surrounds the shank and is disposed between the web **189** and the block **187** and thus maintains the latter under a desired pressure. The pressure may be changed as desired by adjustment of the nut **191**.

Actuation of the hammer **175** in time with the other moving parts of the machine is effected by cam action through a train of links and levers connecting with an arm **195** which extends outwardly as an integral part of the upper toggle link **186**. The outer end of the arm is connected to a link **196** which in turn connects with an arm **198** of a bell crank lever **199**. Bell crank lever **199** is mounted on a short shaft **201** carried in bearings **202** (Fig. 14) formed in an extension **203** of the auxiliary frame **13** this being a part of the frame which supports the bracket **137**.

A second arm **205** (Figs. 10 and 14) of the

bell crank lever 199 carries a cam roller 206 which operates in a cam groove 207 formed in the double cam 67. The cam groove 207 is on the opposite side of the cam groove 66. It will now be understood why the cam 67 is referred to as a double cam.

The partially formed can body coming to rest in the bumping station H is thus acted upon by the hammer 175 which moving down on the overlapped side seam edges *d*, *e*, presses them tightly together. The confined adhesive *f* forms the bond between the pressed together seam parts, uniting them in the tight side seam *g* hereinbefore explained, the cooled hammer immediately setting the adhesive.

When the hammer 175 strikes the side seam the horn 131 at that moment is additionally supported from below by a vertically movable anvil 211 (Fig. 10). The anvil is provided with a square shank 212 which slides in a guideway 213 formed in the frame extension 203. This shank is connected by a link 214 to a third arm 215 of the bell crank lever 199.

Accordingly when the bell crank arm 199 rocks, in actuating the hammer 175, it also moves the anvil upward against the bottom of the horn 131 and thus takes or absorbs the thrust of the seam bumping action. This relieves the horn supporting roller 136 from bearing the full force of the seam bumping load.

Bumping of the side seam completes the forming of the can body which now appears as illustrated in Fig. 8. The body is then pushed off the end of the horn 131 on the next stepped movement of the feed bars 15 and is discharged to any suitable place of deposit.

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 form, construction and arrangement of the parts without departing from the spirit and scope of the invention or sacrificing all of its material advantages, the form hereinbefore described being merely a preferred embodiment thereof.

I claim:

1. In a machine for making fibre can bodies from flat blanks having side seam edges and provided with an adhesive, the combination of intermittent feeding devices for advancing said blanks in a step by step movement through the machine, body forming instrumentalities for bending an advancing blank into a tubular can body shape while bringing the side seam edges into juxtaposition, an element for bringing together the seam edges of said formed blank with the tacky adhesive therebetween to form a holding bond for the edges thus producing a side seam for the can body, and means for supporting said formed body while its side seam edges are being secured.

2. In a machine for making fibre can bodies from flat blanks having side seam edges one of which is provided with a dried adhesive, the combination of intermittent feeding devices for advancing said blanks in a step by step movement through the machine, cutting elements adjacent the path of travel of said advancing blank for cutting away a portion of a side seam edge of said blank, body forming instrumentalities for bending an advancing blank into a tubular can body shape while bringing the side seam edges into juxtaposition, means for converting the adhesive into a tacky mass, an element for bringing together the seam edges of said formed blank so that the tacky adhesive will form a holding bond between them thus producing a side seam for the can body, and means for supporting said formed body while its side seam edges are being secured.

3. In a machine for making fibre can bodies from flat blanks having side seam edges one of which is provided with a thermoplastic adhesive, the combination of feeding devices for advancing said blanks, stationary body forming instrumentalities disposed adjacent the path of travel of said blank for progressively bending an advanced blank into a tubular can body shape while bringing the side seam edges into juxtaposition, heating means for converting said adhesive into a tacky mass, a bumping element for squeezing together the seam edges of said blank while the interposed adhesive is tacky thereby producing a tight side seam for the can body, and means for supporting said formed body while its side seam edges are being bumped.

4. In a machine for making fibre can bodies from flat blanks having side seam edges one of which is provided with a thermoplastic adhesive, the combination of feeding devices for advancing said blanks, stationary body forming instrumentalities disposed adjacent the path of travel of said blank for progressively bending an advanced blank into a tubular can body shape while bringing the side seam edges into juxtaposition, heating means for melting said adhesive into a tacky mass, a bumping element for squeezing together the seam edges of said blank while the adhesive is tacky thereby producing a tight side seam for the can body, said bumping element being formed for the circulation of a fluid cooling medium therethrough for cooling the body side seam as it is produced, and means for supporting said formed body while its side seam edges are being bumped.

5. In a machine for making fibre can bodies from flat blanks having side seam edges one of which is provided with a dried adhesive, the combination of feeding devices for intermittently advancing said blanks in a step by step movement through the machine, body forming instrumentalities for bending an advancing blank into a tubular can body shape while bringing the side seam edges into juxtaposition, a forming horn around which said blank is bent for supporting the latter, said horn having a passageway through which a fluid cooling medium is circulated for cooling said formed body, means for converting the adhesive into a tacky mass, and an element for bringing together the seam edges of said formed blank so that the tacky adhesive will form a holding bond between them thus producing a side seam for the can body.

6. In a machine for making fibre can bodies from flat blanks having side seam edges one of which is provided with a dried adhesive, the combination of feeding devices for intermittently advancing said blanks in a step by step movement through the machine, body forming instrumentalities for bending an advancing blank into a tubular can body shape while bringing the side seam edges into juxtaposition, heating means for heating the side seam edges of the formed body and for melting the adhesive into a tacky mass, holding members for properly positioning said side seam edges while being heated, an element for bringing together the seam edges of said formed blank so that the tacky adhesive will form a holding bond between them thus producing a side seam for the can body, and means

for supporting said formed body while its side seam edges are being secured.

7. In a machine for making fibre can bodies from flat blanks having side seam edges one of which is provided with a dried adhesive, the combination of feeding devices for intermittently advancing said blanks in a step by step movement through the machine, body forming instrumentalities for bending an advancing blank into a tubular can body shape while bringing the side seam edges into juxtaposition, heating means for heating one of said side seam edges by radiation and for directing a blast of hot air against the other of said side seam edges to render the adhesive as a tacky mass, an element for bringing together the seam edges of said formed blank so that the tacky adhesive will form a holding bond between them thus producing a side seam for the can body, and means for supporting said formed body while its side seam edges are being secured.

8. In a machine for making fibre can bodies from flat blanks having longitudinal creases along which the blank is to be folded and having side seam edges one of which is provided with a thermoplastic adhesive, the combination of feeding devices for longitudinally advancing said blanks along a predetermined path of travel, body forming instrumentalities for bending an advanced blank along said creases and into a tubular can body shape while folding the side seam edges into juxtaposition, a forming horn around which said blank is folded and which supports said body after forming, heating means for the side seam edges of said formed body and for melting the adhesive thereon, and a bumping element adjacent said horn for bumping said seam edges into a tight side seam while the formed body is supported on said horn.

9. In a machine for making fibre can bodies from flat blanks having longitudinal creases along which the blank is to be folded and having side seam edges one of which is provided with a thermoplastic adhesive, the combination of feeding devices for intermittently and longitudinally advancing said blanks along a predetermined path of travel, spaced pairs of stationary body forming guides disposed adjacent the path of travel of said blank, said guides progressively folding said blank along corresponding creases as the blank is advanced in a step by step movement through each pair of guides, bending rails disposed adjacent the first pair of guides and over which portions of the blank are folded, a body supporting horn adjacent other pairs of guides and around which other portions of the blank are folded, stationary bending members adjacent said horn for folding the side seam edges of said blank into proper position, heating means for said side seam edges and for said adhesive while the folded body is supported on and advanced along said horn, and a bumping element for securing said heated seam edges together to provide a tight side seam for the can body thereby produced.

MAGNUS E. WIDELL.