Aug. 2, 1960 J. J. LOUGHNEY 2,947,276

METHOD OF PRODUCING CAN BODY BLANKS WITH SPACING PROJECTIONS

Filed April 15, 1955

FIG. 4

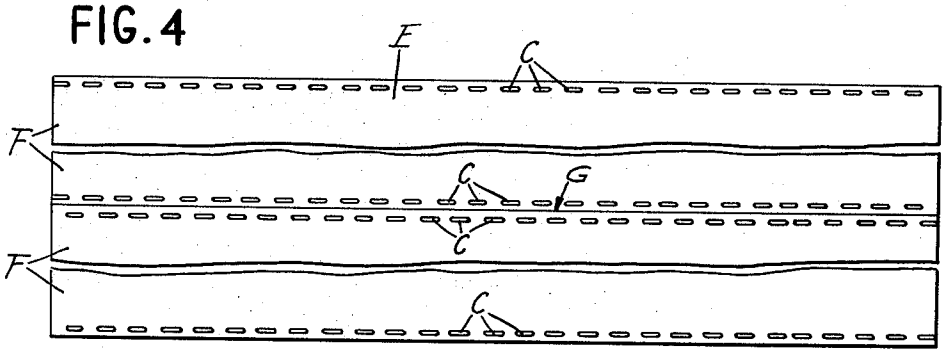


FIG. 5

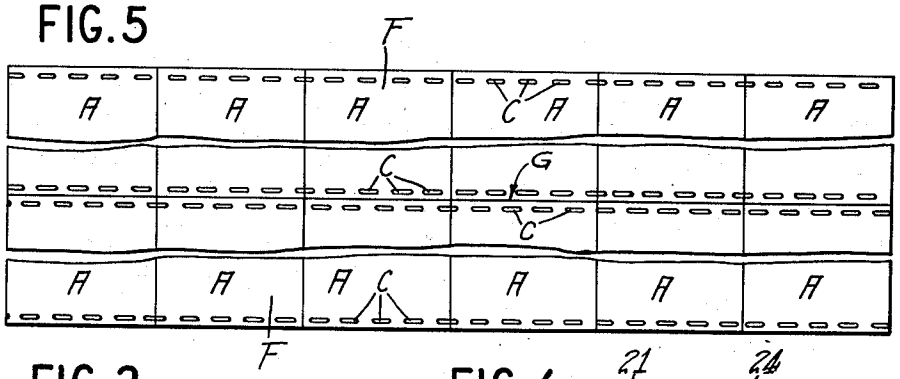


FIG. 3

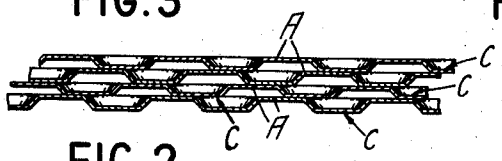


FIG. 6

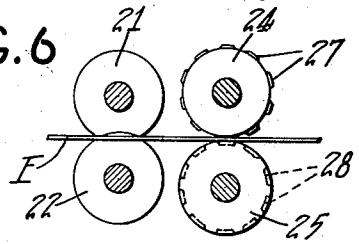


FIG. 2

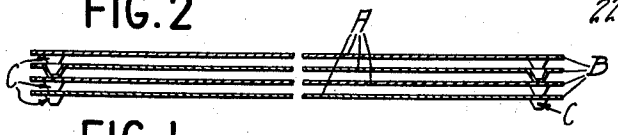


FIG. 1

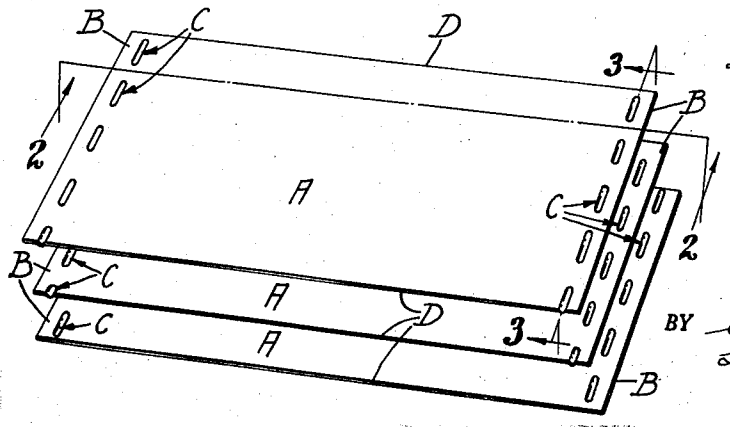
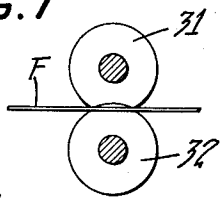


FIG. 7



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2,947,276

Patented Aug. 2, 1960

2,947,276

METHOD OF PRODUCING CAN BODY BLANKS WITH SPACING PROJECTIONS

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Filed Apr. 15, 1955, Ser. No. 501,463

1 Claim. (Cl. 113—120)

The present invention relates broadly to the manufacture of sheet metal cans or containers, and has particular reference to a method of producing and handling can body blanks in quantities for stacking in spaced relation to prevent feeding of double blanks from the stack.

In the manufacture of sheet metal cans or containers, comparatively larger sheets of tin plate or the like material are cut into strips of a width substantially equal to the periphery of a can body and these strips are then cut transversely into pieces having a width substantially equal to the height of the body to produce individual blanks from which the can bodies are subsequently formed. This cutting of the sheets to can body blank size usually is effected in a tandem slitter. As the blanks are discharged from the slitter they usually are deposited directly into stacking bins located adjacent the slitter, the blanks of each strip as it is cut falling on top of the blanks of a previously cut strip to build up in the bins individual stacks which are removed and transferred manually to the feed magazine of a can body maker.

In the body maker, the blanks are fed individually from the bottom of the magazine and are advanced through the machine, stopping at several working stations at which operations such as notching, hook forming, bending into body shape, interengagement and bumping of hooks to produce a uniting side seam, are performed to transform the blanks into can bodies. In some cases a cement is embodied in the side seams and in other cases the seams are soldered, to render them hermetic.

In feeding the blanks from the magazine difficulty is sometimes experienced when two or more blanks stick together. In such cases the adhering blanks are fed as one, and if not promptly detected, advance to the working stations where considerable damage to the body maker may result. Numerous devices have been developed to detect such multiple-thickness blanks but at high speed operation in the range of 500 blanks per minute, most of these devices are not completely satisfactory.

It is an object of the instant invention to overcome this difficulty by the provision of a method of producing and handling can body blanks for automatic feeding from a stack, wherein the blanks themselves are provided with a safety feature i.e. are formed with a series of projections of embossments disposed in at least a pair of opposed marginal edge portions of the blanks and spaced inwardly from the outer edges of the blank to support an adjacent juxtaposed blank when the blanks are stacked one upon the other to retain the blanks in the stack in spaced apart relation to facilitate feeding of the blanks individually from the stack so as to prevent the feeding of double or stuck-together blanks.

Another object is the provision of such a method of producing can body blanks wherein the projections are formed in the material before the blanks are cut and in unpredetermined haphazard relation to the end edges of

the material or the blank so as to vary the location of the projections in each blank to prevent nesting of the projections in adjacent blanks when stacked on top of each other and thereby effect through the projections a supporting, in spaced apart relation, of one blank by an adjacent blank.

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 plurality of can body blanks in exploded stacked relation and embodying the instant invention and produced in accordance with the steps of the instant method invention;

Fig. 2 is an enlarged sectional view of a plurality of blanks in unexploded stacked relation as viewed substantially along a longitudinal plane indicated by the lines 2—2 in Fig. 1, with parts broken away;

Fig. 3 is a view similar to Fig. 2 as viewed substantially along a transverse plane indicated by the lines 3—3 in Fig. 1, with parts broken away;

Fig. 4 is a top plan view of a sheet of material from which the blanks shown in Fig. 1 are made, the view showing the relation of the blank separating projections and how the sheet is initially divided into strips, parts being broken away;

Fig. 5 is a view similar to Fig. 4 showing how the divided sheet of material is further divided transversely to produce the blanks shown in Fig. 1, parts being broken away; and

Figs. 6 and 7 are schematic sectional views of principal parts of one form of apparatus for forming the projections in the sheet and for dividing the sheet in accordance with the method steps of the invention to produce the can body blanks of the invention as shown in Fig. 1.

As a preferred or exemplary embodiment of the instant invention the drawings illustrate the method steps of producing rectangular sheet metal can body blanks A (Fig. 1) preparatory to stacking them one on top of the other for automatic feeding into a can body making machine to produce can bodies therefrom.

The can body blanks A preferably are made of tin plate, black plate or the like material and are substantially flat. Along at least two opposing marginal edge portions, preferably transverse edge portions B, each blank A is provided with a row or series of projections C preferably formed by displacing portions of the material of the blank outwardly from one face thereof. The projections C preferably are spaced inwardly from the outer edges of the marginal edge portions B in which they are located so as to provide a margin between the projections and the adjacent edges of the blank.

The projections or embossments C preferably are shallow elongated elements measuring from two to four thousands of an inch in thickness or depth, about one thirty-second of an inch wide and approximately one-sixteenth of an inch long. The projections may be spaced apart equal or unequal distances and with respect to the adjacent angularly disposed edges, preferably the longitudinal edges D of the blank, the entire series is located in an unpredetermined spaced relation to the edges D so that the transverse location of the projections C in any one of a plurality of such blanks A is different than all the other blanks.

Hence when a plurality of the blanks A are stacked one on top of the other with their outer edges substantially aligned as shown in Figs. 2 and 3 the projections C

in their unpredetermined locations are unaligned relative to the projections in adjacent blanks in the stack. The unaligned projections C in adjacent blanks are thereby prevented from nesting one within the other, with the result that the projections of one blank supports and maintains the blank in spaced apart relation to subjacent and superposed blanks and thereby provides for easy automatic feeding of the blanks individually from the stack without the blanks sticking together. Double blanks are thereby prevented from being fed from the stack.

Providing the projections C in the blanks A in different unpredetermined or unrelated locations to support and maintain the stacked blanks in spaced apart relation for automatic feeding from the stack may be effected in any suitable manner. One such method of preparing blanks for feeding from a stack is illustrated in Figs. 4, 5, 6 and 7. In this method the projections C are formed in a sheet E of material from which a plurality of the blanks A are to be produced and the sheet divided into strips F containing the projections. The strips are then further divided transversely into the blanks A so that each blank contains two series of the projections.

The forming of the projections or embossments C and the dividing of the sheet E into strips F preferably are effected simultaneously although these steps may be effected separately if desired. The sheet may first be divided into strips and the projections formed in the strips or the projections formed in the sheet first and the sheet then divided into strips. In the preferred method, a sheet E of proper dimensions to contain a predetermined number of blanks A is fed longitudinally between cooperating pairs of slitting rollers **21, 22** (Fig. 6) which slit the sheet E along lines of severage G (Fig. 4) to divide the sheet into strips F. In the drawings Fig. 4 shows a sheet E divided into two strips F.

Simultaneously with this slitting action the projections C are produced in the strips F in a location adjacent and spaced inwardly from and extending along the outer longitudinal edges of the strips, i.e. along the outer edges of the sheet and along both sides of the slit G. The projections C preferably are produced by cooperating pairs of forming rollers **24, 25** (Fig. 6) which are disposed immediately behind the slitting rollers **21, 22** and which impress the projections in the strips while the strips are being divided from the sheet. For this purpose, the forming roller **24** is provided entirely around its periphery with a series of radially projecting and circumferentially spaced forming lugs **27** of a height, width and length corresponding to the dimensions of the projections C. These forming lugs **27** mesh with cooperating recesses or depressions **28** in the forming roller **25** so that as the sheet being slit passes between the forming rollers **24, 25**, the cooperating lugs **27** and depressions **28** displace corresponding portions of the material of the sheet by forming recesses in one side of the sheet and embossments or projections which are the projections C on the opposite side of the sheet. These slitting rollers **21, 22** and forming rollers **24, 25** are located in pairs transversely of the path of travel of the sheet so as to produce the projections C in properly spaced relation inwardly of the longitudinal edges of the resulting strips F.

An odd number of the lugs **27** is provided on the periphery of the forming roller **24** to facilitate unpredetermined location of the projections C on the strips F. The lugs **27** may be equally or unequally spaced apart to produce equal or unequal spaced relation of the projections C as hereinbefore mentioned. The forming rollers **24, 25** for adjacent strips F in a sheet E preferably are also arranged with their lugs **27** in staggered relation so as to produce the projections C in one strip in staggered relation to the projections C in an adjacent strip as shown in Fig. 4.

The feeding of a sheet E or strip F into position between the forming rollers **24, 25** is effected in untimed relation to the rotation of the rollers and the location of the forming lugs **27** thereon so that as the leading edge of a strip enters between the forming rollers, the first lug **27** of the roller **24** engages the strip and forms the first projection C of the series in an unpredetermined relation to the edge of the strip and thereby locates the entire series of projections without regard for its relation to the edge of the strip. In this manner the location of the first projection C relative to the leading edge of the strip may be of infinite variations within the range of the pitch or space between the projections in the series. Hence each strip of a plurality of separately formed strips will have its projections spaced differently or out of phase in relation to the leading edges of the strips.

Upon passage of the entire sheet through the slitting rollers **21, 22** and forming rollers **24, 25**, there results a plurality of the strips F containing the projections C along their outer longitudinal edges as mentioned hereinbefore. These strips F are next divided into portions equal to the blanks A by slitting the strips F transversely as shown in Fig. 5. This transverse slitting of the strips F is effected without due regard for the location of the projections C with the result that each blank A upon being cut from the strip F contains a series of the projections C located along and spaced inwardly from at least two opposing marginal edge portions of the blank and the location of the projections in each blank with respect to the angularly disposed connecting edges is different from the location of the projections in adjacent blanks.

This transverse cutting of the strips F into blanks A preferably is effected by passing the strips transversely between a gang of properly spaced cooperating pairs of upper and lower cutting rolls **31, 32** (Fig. 7) which are rotated in unison in any suitable manner. The blanks A as they are cut from the strips F usually fall into place on top of other previously cut blanks caught in a series of adjacently disposed magazines to form stacks of the blanks for subsequent use. In other words an individual blank of each strip is stacked on the corresponding blank of an adjacent strip. As the stacks build up to a desired height they are removed manually and placed in this stacked formation as shown in Fig. 2 in the magazine of a bodymaker to be fed individually to the can body making stations. It is in this magazine that the projections C in the blanks A maintain the blanks in properly spaced apart relation to facilitate feeding of the blanks singly and to prevent the feeding of doubles.

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 and that changes may be made in the steps of the method described and their order of accomplishment 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:

The method of producing stacks of sheet metal can body blanks to prevent sticking thereof during successive feeding of individual blanks from the stacks, comprising longitudinally slitting a flat rectangular metal sheet into a plurality of elongated rectangular strips of equal length while simultaneously progressively indenting the strips to form shallow embossments in the opposite longitudinal marginal portions of said strips at spaced intervals therealong with the initial embossments of each strip spaced randomly from the leading end of each strip and the embossments of each strip disposed in out of phase relationship with the corresponding embossments of an immediately adjacent strip, slitting said indented strips transversely at uniformly spaced intervals to form a plurality of individual flat rectangular body blanks of equal size with said embossments disposed along two

opposite marginal portions of each blank, said embossments in the blanks formed from each strip being respectively disposed in out of phase relationship to the embossments in the corresponding blanks of said adjacent strip, and stacking the individual blanks of each of said strips on the corresponding blanks of said adjacent strip to form a plurality of stacks wherein the embossments on adjacent blanks are disposed in out of phase relationship to permit the blanks to be individually and successively fed from the stacks without sticking.

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