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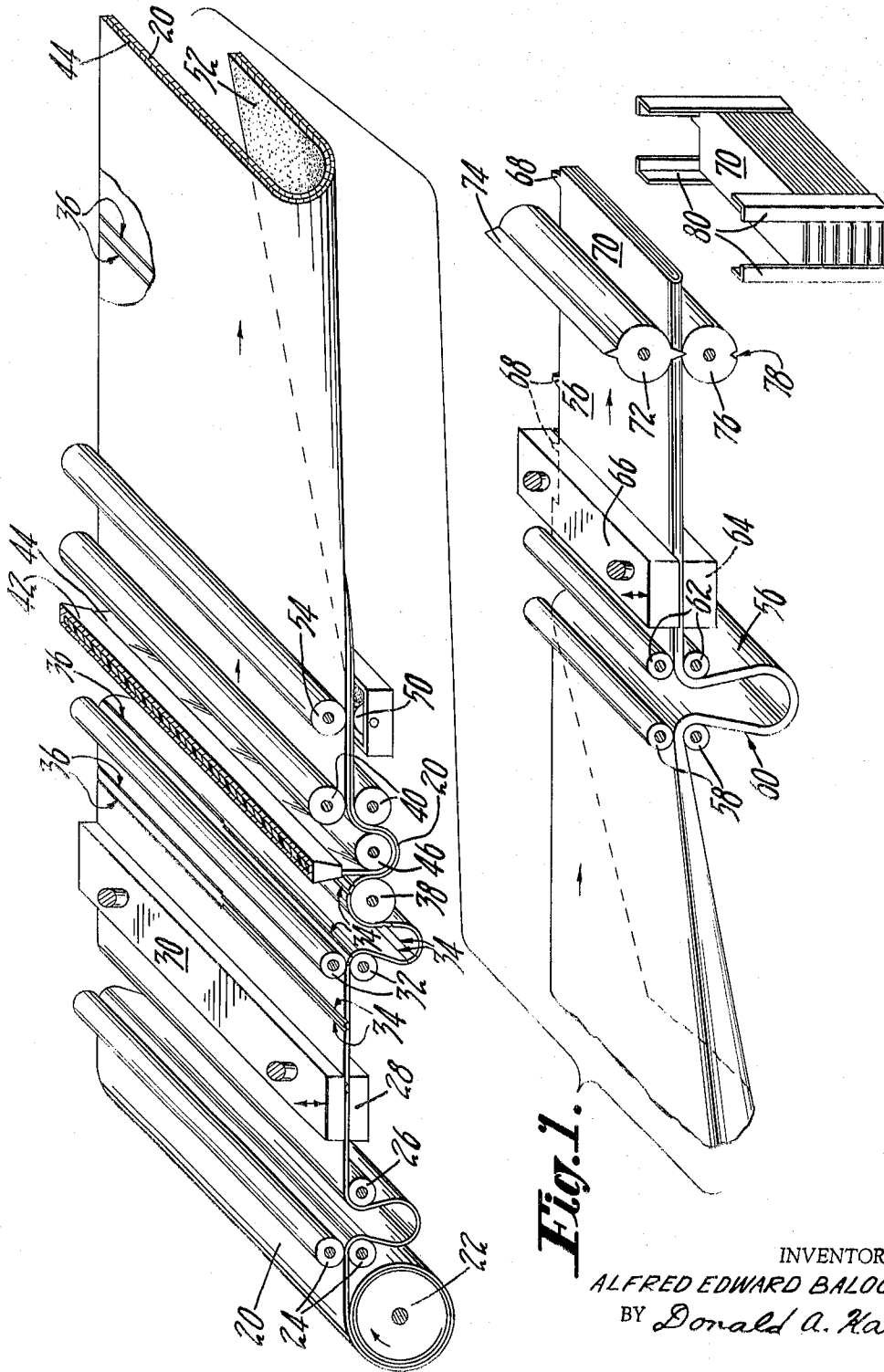
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3,252,385

METHOD OF MAKING AN EASY-OPEN FIBRE CONTAINER

Filed Aug. 21, 1963

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

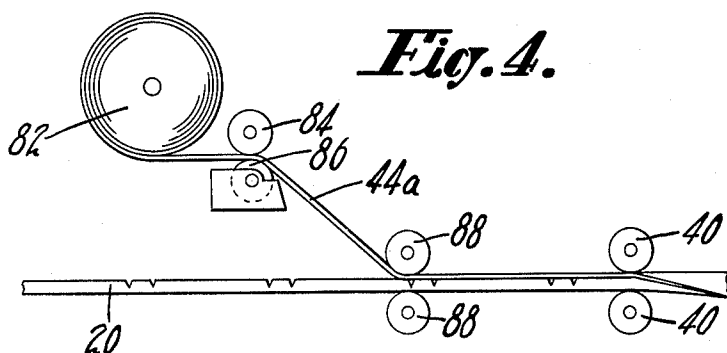


Fig. 2.

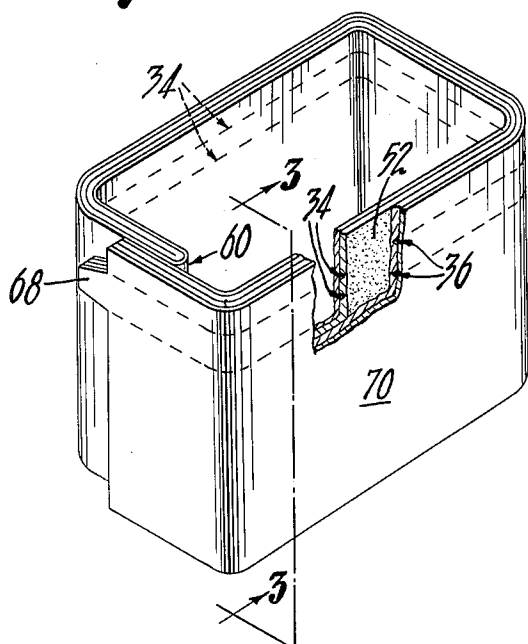
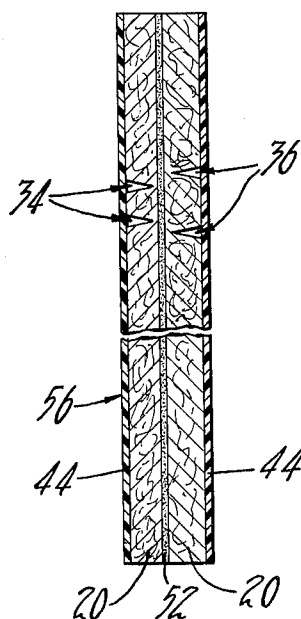


Fig. 3.



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METHOD OF MAKING AN EASY-OPEN FIBRE CONTAINER

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15 Claims. (Cl. 93—36)

This invention relates to fibre containers for comestibles and more particularly it relates to a method of manufacturing such containers with a tear-strip type self-opening feature.

When fibre containers are used for packaging frozen foods, such as frozen strawberries, such containers must be of sufficient strength and rigidity to maintain their shape when the contents are in a liquid or semi-liquid state, and must also be of sufficient strength and thickness to resist splitting, cracking and the like when such contents are frozen. When moisture, either from within or without the container, comes into contact with the fibre stock of the container body, wicking occurs and moisture penetrates and saturates the fibre, thus seriously weakening the container. To prevent such wicking from occurring, it has become common practice to line both the inside and outside of the fibre container body with a moisture-impervious coating layer which can be applied either before or after the container is formed into its final shape. Naturally, from a standpoint of manufacturing simplicity, it is preferable to apply such coating layers before final formation of the container and while the fibre stock is still in the form of a blank, but the prior art methods affixed such coating layers only to the face surfaces of the blank, thus leaving raw fibre edges through which wicking could still occur after the blank was formed into a finished container.

When fibre containers are to be used for ready-to-bake dough products, such as biscuits, in addition to the above-mentioned problems of moisture penetration, the additional problems of grease penetration and high internal pressure are present. When doughy food products are packaged within a container, the yeast therein becomes active at room temperatures and causes extreme internal pressure. To make a fibre container moistureproof, greaseproof, and strong enough to withstand the internal pressures of dough products, it has become common practice to line the inside, and sometimes the outside, of such a container with a metallic foil. Such foil coatings are generally applied to the fibre while it is in a blank form prior to its formation into a finished container but, as described above for frozen food containers, the foil coatings cover only the faces of the blank and leave the edges raw, thus producing the strong possibility of edge wicking, particularly in the side seam area.

Generally, but not necessarily, the fibre containers for frozen food are rectangular in shape and the fibre containers for baked goods are cylindrical in shape with both forms of containers using metal end caps to seal the products therein. To remove such products, the fibre must be perforated in some manner. Generally, the frozen food packages are opened by cutting through the fibre with a knife and the baked goods packages are opened by striking the package against a sharp edge or by pulling a string to initiate perforation of the fibre along a helical score. While these opening techniques are adequate, there is room for opening techniques more convenient to the consumer; and, aside from the difficulties in opening fibre containers by the known techniques, the ancillary problems of spillage and/or contamination of the contents make such opening techniques subject to improvement.

A fibre container having a built-in self-opening feature, such as a tear strip, overcomes the aforementioned opening difficulties and provides a safe and convenient way to perforate a fibre container to remove the contents therefrom. The present inventor is not the first to recognize this fact, and a few prior art fibre containers have disclosed the use of tear strips as opening means. However, while such prior art containers could be easily opened, the score lines which defined the tear strip extended into the fibre body and permitted seepage of moisture thereinto, thus lowering the strength and rigidity of the container. Attempts were made to overcome this problem of score line seepage by applying protective coatings over the score lines, but since such coatings would tend to flow into the scored grooves, it was necessary to apply a heavy coating to achieve the protection desired. This proved to be unsatisfactory, both because it was uneconomical and because it required too many special application techniques to be compatible with high-speed continuous production methods used for manufacturing such fibre containers.

An object, therefore, of the present invention is to overcome the aforementioned difficulties and shortcomings associated with the prior art and to provide a new and improved method for manufacturing a fibre container with a built-in self-opening means.

A further object of this invention is to provide a method for manufacturing a fibre container having a side seam protected against wicking.

Another object of this invention is to provide a method for fabricating a fibre container having score lines which are suitably protected against fluid seepage through them into the fibre.

A still further object of this invention is to provide a method for producing a fibre container from a blank and wherein a single coating operation protects both sides of the blank and the tear strip score lines formed therein, to thus provide a container with both an inner and an outer covering.

Yet another object of this invention is to provide a simplified method for producing a laminated container having high strength and rigidity and also having inner and outer protective coatings.

Still another object of this invention is to provide a method for continuously manufacturing container body blanks out of sheet stock with a minimum of separate manufacturing steps, thus providing an economical, yet high-speed method of manufacture.

Still a further object of this invention is to provide a method for manufacturing a container having score lines which are located in such a manner that they can be of a minimum length to thus reduce the danger of seepage thereinto, but are still of sufficient length to facilitate ready easy-opening of the container.

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.

The foregoing objects are accomplished by feeding a fibre web longitudinally from a roll, scoring parallel lines of weakness or cuts transversely at spaced intermittent intervals along said web, said score lines extending approximately to the medial portion of said web, and applying a protective coating to the scored surface of said web. Adhesive is then applied to the uncoated surface of said web and the web is folded longitudinally in half, thus producing a laminated fibre container material having two layers of fibre joined together by adhesive with a protective coating over the outside of each fibre layer and over one edge thereof. The laminated material is then severed

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transversely at spaced intervals to produce individual body blanks each having a pair of offset score lines therein which set off a tear strip. The individual body blanks are then formed into a suitable tubular package shape with the coated edge forming the inner side seam edge, and metal ends are applied, thus forming a package having an integral tear strip therein. The term "tubular" as used herein connotes any suitable hollow cross-sectional shape, such as circular, rectangular, elliptical or the like.

Referring to the drawings:

FIG. 1 is a two-part continuous diagrammatic perspective view of apparatus suitable for carrying out the method of the present invention, the lower part of the figure being a continuation of the upper part, as shown;

FIG. 2 is a perspective view of an individual body blank, as fabricated by the apparatus of FIG. 1, formed into a container shape;

FIG. 3 is a transverse sectional view through the wall of the container, taken along line 3—3 of FIG. 2; and

FIG. 4 is a side elevational view of a modified portion of the apparatus of FIG. 1.

As a preferred or exemplary form of the inventive method herein disclosed, FIG. 1 illustrates a web 20 of fibre or paperboard being fed longitudinally from a roll 22 by means of a pair of feed rollers 24 which frictionally engage the upper and lower surfaces of the web disposed between them. The web 20 then loops downward, feeds over an idler roller 26 and passes between a platform 28 and a reciprocating scoring die or rule die 30. A pair of intermittent feed rollers 32 beyond the scoring die selectively advance and stop the web 20 to permit scored grooves to be formed at selective intervals therealong.

As the intermittent feed rollers 32 stop the web 20, the reciprocating scoring die 30 lowers and knife blades thereon, not shown, score grooves or lines of weakness in the web as it is supported by the platform 28. The scored grooves include a first pair 34 extending from one edge of the web to approximately the center thereof and a second pair 36 extending from the other edge of the web to approximately the center thereof. As shown, scored grooves 36 are spaced slightly wider apart than are scored grooves 34 and both pairs of scored grooves serve to define a tear strip when the web is finally formed into individual container bodies as described hereinafter. Since the scored grooves 36 are offset from the scored grooves 34, the distance of this offset corresponds to the amount of fibre which must be torn to remove the tear strip. Generally, the size of the offset should be quite small, preferably less than 0.25 inch, to permit easy removal of the tear strip. It is within the purview of the instant invention that the first pair of scored grooves 34 may be replaced by a single groove in alignment with the centerline between the grooves 36.

After the scored web 20 passes between the intermittent feed rollers 32, it loops downward and rises again to pass over an idler roller 38. A pair of continuous feed rollers 40, spaced beyond the idler roller 38, advance the scored web continuously beneath an extrusion nozzle 42 which extrudes a molten film 44 of thermoplastic onto the scored surface of the web 20. The idler roller 38 acts as a back-up roller to support the web 20 as the film 44 is lamination-extruded thereonto. Subsequently, the coated web passes under and around a chill roll 46 which compresses the two webs and adheres the plastic to the paper and cools the extruded thermoplastic web. The lower of the feed rollers 40 is sometimes used to hold the web against the chill roll.

After the web 20 has been coated and fed between the feed rollers 40, it passes between a lower adhesive applying roller 50, which applies an adhesive coating 52 to the uncoated surface of the web, and an upper support roller 54 which supports the web as the adhesive is being applied. After the adhesive coating 52 has been applied, the web 20 is gradually folded in half to form a laminated

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web generally designated 56. Though no specific means has been illustrated for folding the web in half, it will be understood by those skilled in the art that many suitable forms of apparatus can be used to accomplish the folding. One such apparatus constitutes a series of web edge engaging rollers which are biased to gradually fold one edge of the web under the other to form the doubled or laminated web 56.

When the web is finally folded in half, a pair of feed rollers 58 compress the two halves of the web together and the adhesive coating 52 causes the two halves to adhere, thus forming the laminated web 56. Because of the folded construction of the laminated web, the two edges of the web 20 form one edge, denoted the raw edge, of the laminated web 56. The other edge of the laminated web, where the fold is located, is a closed or coated edge generally denoted 60. In addition to acting as compressing means, the feed rollers also act to constantly feed the laminated web 56. After the web is fed through the rollers 58, it loops downward, then rises again and feeds through a pair of intermittent feed rollers 62 which intermittently advance the laminated web 56 between a support platform 64 and a reciprocating tab forming die 66.

As the intermittent feed rollers 62 stop the web 56, the reciprocating die 66 lowers and knife blades thereon, not shown, cut away marginal portions of the web 56 at its raw edge leaving a tab 68 remaining attached to the web. During this operation, the web is supported by the platform 64. The laminated web 56 is then fed past a suitable severing means which operates in synchronization with the rollers 62 to intermittently separate the laminated web into individual body blanks 70. The severing means illustrated consists of an upper roller 72 having transversely extending knife blades 74 and a lower roller 76 having cooperating transverse grooves 78. The rotation of the knife blades 74 as the web 56 passes between the rollers 72 and 76 causes the web to be slit transversely at spaced intervals with the distance between the slits being equal to the height of the containers to be formed from the body blanks 70. The severed blanks 70 drop between upstanding guides 80 which maintain the blanks in stacked relationship.

In the modification illustrated in FIG. 1, the fibre web 20 is laminated with a thermoplastic film 44 and while many types of thermoplastic materials are suitable, polyethylene is preferred since it is particularly adaptable for use in frozen food containers and is not ordinarily subject to splitting, cracking, or other types of failure normally associated with frozen food package coatings.

However, when a fibre container is used to package ready-to-bake dough products, it is commonly lined with a metallic foil rather than a thermoplastic film because of the greater resistance of the metallic foil to grease seepage, internal pressure and high temperature. The metallic foil can be applied to the fibre web in a manner very similar to the manner of application of the thermoplastic film 44. As can be seen from FIG. 4, a layer of thin metallic foil 44a, such as aluminum, is supplied from a roll 82 and passes between an upper support roller 84 and a lower adhesive applying roller 86 which supplies a coating of suitable adhesive from a source thereof onto the undersurface of the foil 44a. The adhesively coated foil then lowers onto the scored surface of the fibre web 20 and a pair of pinch rolls 88 apply pressure to adhere the foil 44a onto the fibre web 20. Subsequently, the coated web passes through feed rollers 40 and the laminated web is produced in exactly the same manner as described in connection with FIG. 1.

As shown in FIG. 2, the individual body blanks 70 can be formed about a mandrel, not shown, and into the shape desired for the package. For frozen food containers this shape is generally rectangular while for ready-to-bake dough containers this shape is generally cylindrical. In the rectangular shape shown in FIG. 2, the ends of the body blank 70 are overlapped and adhesively

attached to form a side seam for the container. The coated edge 60 forms the inner or underlap while the edge with the tab 68 forms the outer or overlap. The offset score lines 34 and 36 completely surround the container thus forming an encircling tear strip. As can be seen from FIG. 3, all of the scored grooves are completely protected by the overlying coating 44 thus ensuring that seepage into the scores cannot occur, either from within or without the container. Also, since the edge of the inner lap of the container is sealed or closed at 60, no wicking of the contents can occur. While it is possible for exterior moisture to cause a small amount of wicking through the raw edge from which tab 68 extends, the side seam is overlapped for a sufficient distance to prevent such wicking from adversely affecting the strength or rigidity of the container.

To complete formation of the container of FIG. 2 into a package, an end member is clenched to one end of the container, the container is filled with the desired contents, and another end member is clenched to the other end of the container. When a user grasps the tab 68 and pulls, the tear strip is torn away from the container thus removing one of the end members and thereby opening the package to facilitate removal of the contents therefrom. The location and width of the tear strip may be varied to meet the precise requirements of the nature of the container contents. By offsetting the scores 34 from the scores 36, additional strength is lent to the container, yet the tear strip can still be easily removed.

It is thought that the invention and many of the 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 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 method hereinbefore described being merely a preferred embodiment thereof.

I claim:

1. A method of manufacturing a laminated fibre easy-open container comprising the steps of:
 feeding a fibre web with substantially planar surfaces in a longitudinal direction;
 scoring pairs of offset grooves transversely across one surface of said web at selected intervals therealong;
 applying a protective coating to the scored surface of said web;
 applying an adhesive coating to the unscored surface of said web;
 folding said web in half longitudinally along its center whereby said adhesive coating causes said folded halves to adhere to one another to form a laminated web;
 severing said laminated web transversely at spaced intervals between adjacent pairs of scored grooves and thereby forming a plurality of separate container body blanks; and
 forming each of said body blanks into a tubular container configuration with said scored grooves extending circumferentially therearound and with the ends of said body blank being overlapped and adhesively attached to form a container side seam, whereby said container can be easily opened by manually tearing out the portion between said scored grooves.

2. A method as defined in claim 1 wherein said protective coating is a resinous thermoplastic film.

3. A method as defined in claim 2 wherein said resinous thermoplastic film is polyethylene.

4. A method as defined in claim 1 wherein said protective coating is a metallic foil.

5. A method as defined in claim 1 wherein one pair of grooves is scored from one edge of said web to the longitudinal center thereof and the other pair of grooves is scored from the opposite edge of said web to the lon-

gitudinal center thereof, said one pair of grooves being offset with respect to said other pair.

6. In the manufacture of laminated fibre containers having an integral tear strip therein, the method of:

scoring tear strip defining grooves on one surface of substantially planar fibre stock;
 adhering a protective coating to the scored surface of said fibre stock;
 applying an adhesive coating to the unscored surface of said fibre stock; and
 folding said fibre stock into halves with the fold being substantially normal to the direction of said scored grooves whereby said adhesive coating causes said halves to adhere to one another to form a laminate for use as container body stock.

7. The method defined in claim 6 wherein two pairs of tear strip defining grooves are scored, each pair being offset from the other and each pair extending from the edges of said stock to substantially the center thereof.

8. In the manufacture of coated fibre containers, the method of:

adhering a protective coating to one surface of substantially flat fibre stock;
 applying an adhesive coating to the other surface of said fibre stock;
 folding said fibre stock in half with said halves being adhesively attached together by said adhesive coating;
 forming said folded fibre stock into a tubular configuration with the folded edge of said stock underlapping the unfolded edge thereof; and
 adhesively attaching said folded and unfolded edges together to form a container side seam with a protectively coated inner edge.

9. A method of continuously manufacturing high strength, rigid, moistureproof frozen food containers having their body portions formed essentially of fibrous material with an integral tear strip formed therein, said method comprising the steps of:

longitudinally feeding a flat web of said fibrous material continuously from a source thereof, said web having substantially planar face surfaces extending between continuous lateral edges;
 scoring parallel pairs of tear strip defining grooves transversely across one face surface of said web at selected intervals therealong;
 extruding a congruent thermoplastic film onto the scored face surface of said web;
 applying pressure to said film and said web to cause them to firmly adhere to one another;
 coating the unscored face surface of said web with a suitable adhesive material;
 progressively folding said web longitudinally in half until said opposed halves contact one another, said adhesive material causing said opposed halves to firmly adhere to one another;
 transversely severing said folded web at selected intervals therealong between adjacent pairs of scored grooves to thus form a plurality of individual container body blanks, each having a folded end and an unfolded end;
 forming each of said container body blanks into tubular configuration with the folded end of each blank underlapping the unfolded end thereof and with said scored grooves thus extending circumferentially therearound; and
 adhesively attaching said blank ends in the region of overlap to thus secure said blanks in their tubular configurations.

10. A method as defined in claim 9 wherein two parallel pairs of grooves define said tear strip, one pair extending from one lateral edge of said web substantially to the center thereof, the other pair extending from the other lateral edge of said web substantially to the center

thereof, the grooves of said one pair being spaced wider apart than the grooves of said other pair to thus offset said one pair from said other.

11. A method as defined in claim 9 wherein said thermoplastic film is polyethylene.

12. A method as defined in claim 9 but further characterized by the step of cutting away the marginal edges of the unfolded end of each blank except at the terminus of said scored grooves to thus provide, at one end of the blank, a tab means to facilitate removal of the tear strip.

13. A method of continuously manufacturing high strength, rigid, moistureproof, greaseproof containers for dough products of the ready-to-bake type, said containers having their body portions formed essentially of fibrous material with an integral tear strip formed therein, said method comprising the steps of:

longitudinally feeding a flat web of said fibrous material continuously from a source thereof, said web having substantially planar face surfaces extending between continuous lateral edges;

scoring parallel pairs of tear strip defining grooves transversely across one face surface of said web at selected intervals therealong;

adhesively applying a congruent web of metallic foil to the scored face surface of said web;

coating the unscored face surface of said web with a suitable adhesive material;

progressively folding said web longitudinally in half until said opposed halves contact one another, said adhesive material causing said opposed halves to firmly adhere to one another;

transversely severing said folded web at selected intervals therealong between adjacent pairs of scored grooves to thus form a plurality of individual con-

tainer body blanks, each having a folded end and an unfolded end;

forming each of said container body blanks into tubular configuration with the folded end of each blank underlapping the unfolded end thereof and with said scored grooves extending circumferentially therearound; and

adhesively attaching said blank ends in the region of overlap to thus secure said blanks in their tubular configuration.

14. A method as defined in claim 13 but further characterized by the step of cutting away the marginal edges of the unfolded end of each blank except at the terminus of said scored grooves to thus provide, at one end of the blank, a tab means to facilitate removal of the tear strip.

15. A method as defined in claim 13 wherein two parallel pairs of grooves define said tear strip, one pair extending from one lateral edge of said web substantially to the center thereof, the other pair extending from the other lateral edge of said web substantially to the center thereof, the grooves of said one pair being spaced wider apart than the grooves of said other pair to thus offset said one pair from the other.

References Cited by the Examiner

UNITED STATES PATENTS

2,333,330	11/1943	Moore	43—35
2,751,964	6/1956	Guyer.	
3,020,809	2/1962	Guyer et al.	
3,128,681	4/1964	Miller	93—58

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