Oct. 4, 1966 H. JOHNSON 3,276,664

ADHESIVE PATTERN FOR SELF-SEALING CONTAINER

Filed Oct. 23, 1965 3 Sheets-Sheet 1

Fig. 2

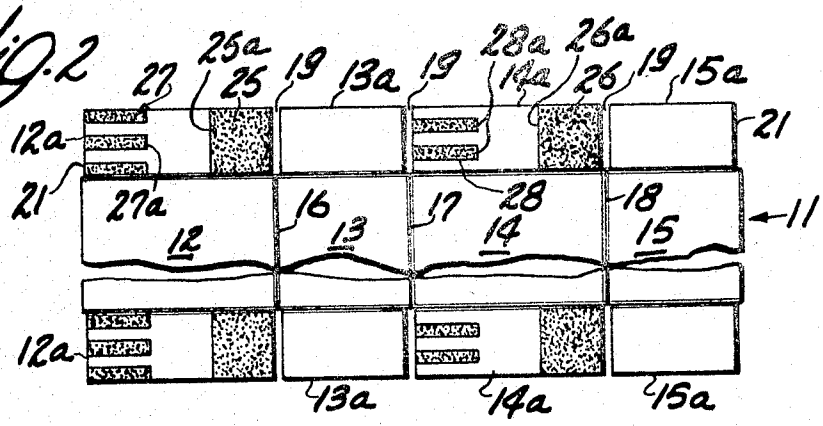


Fig. 1

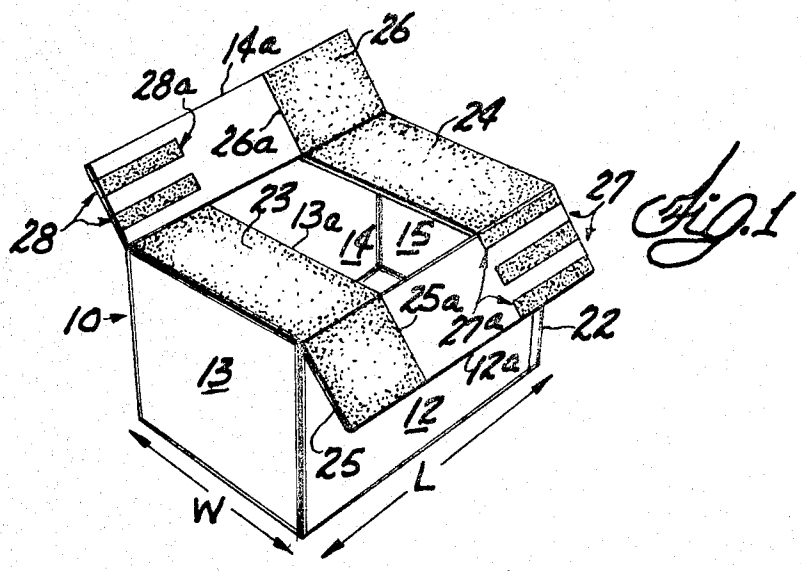
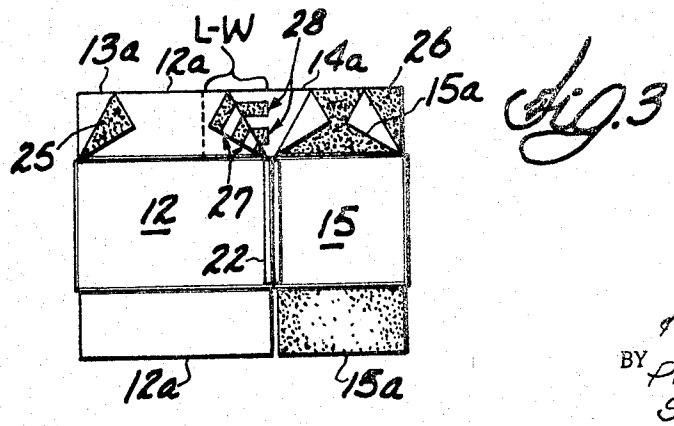


Fig. 3



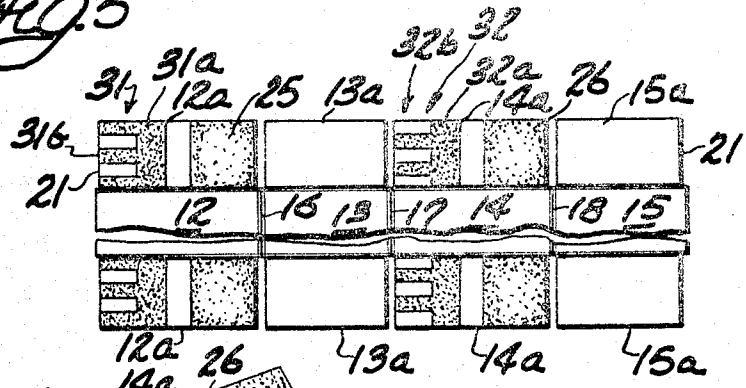
INVENTOR.
Hamilton Johnson
BY Pendleton, Neuman, Seibold & Williams
attys

Oct. 4, 1966 H. JOHNSON 3,276,664

ADHESIVE PATTERN FOR SELF-SEALING CONTAINER

Filed Oct. 23, 1965 3 Sheets-Sheet 2

Fig. 5



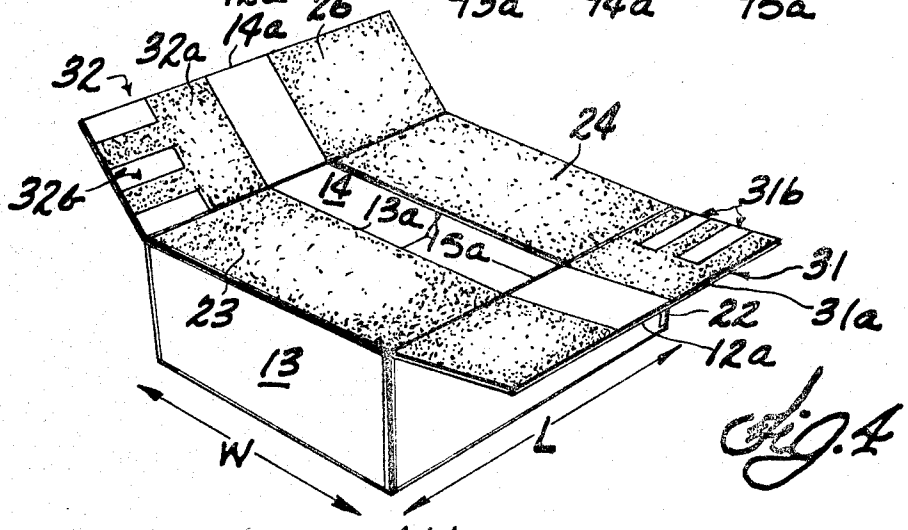


Fig. 4

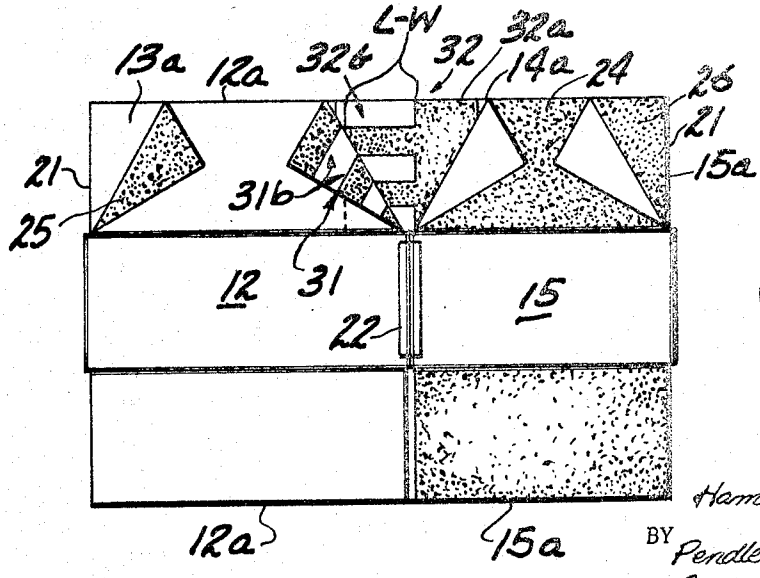


Fig. 6

INVENTOR.
Hamilton Johnson
BY Pendleton, Neuman, Seibold & Williams
Attys

Oct. 4, 1966 H. JOHNSON 3,276,664

ADHESIVE PATTERN FOR SELF-SEALING CONTAINER

Filed Oct. 23, 1965 3 Sheets-Sheet 3

Fig. 8

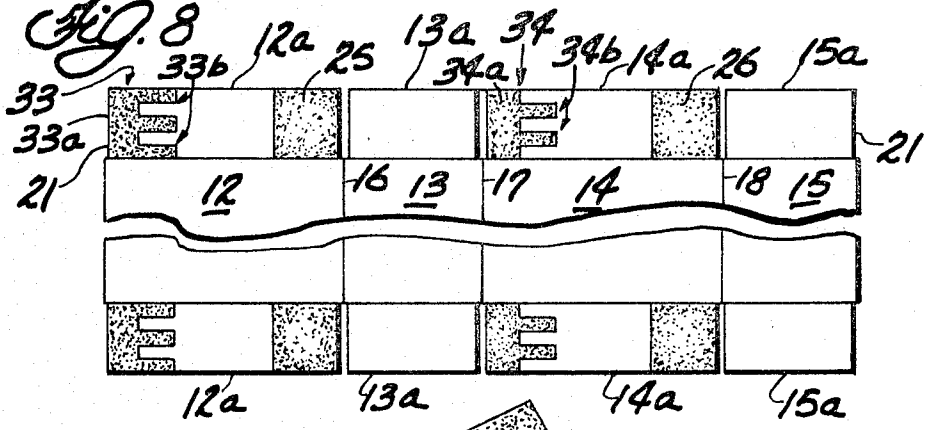


Fig. 7

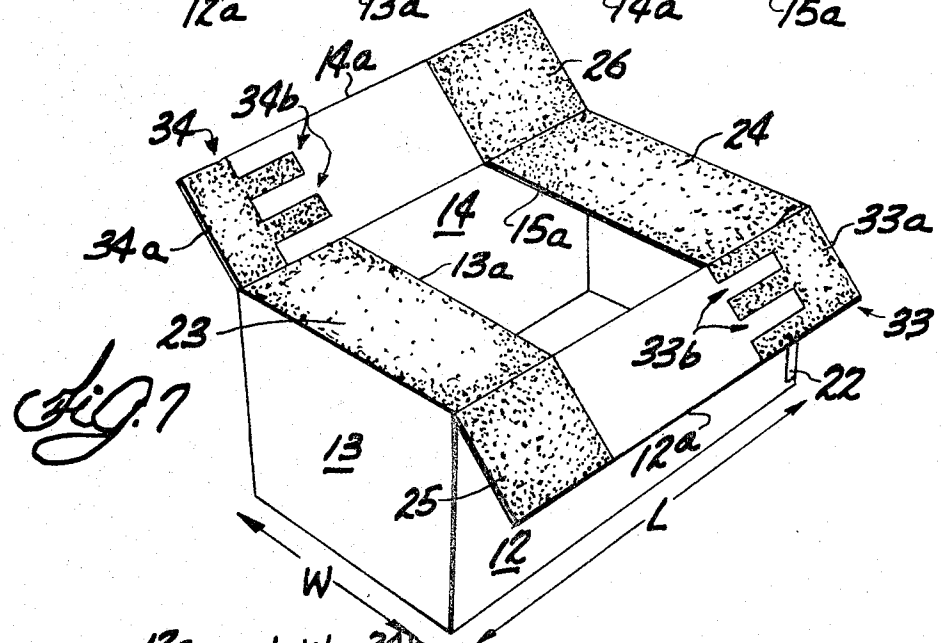
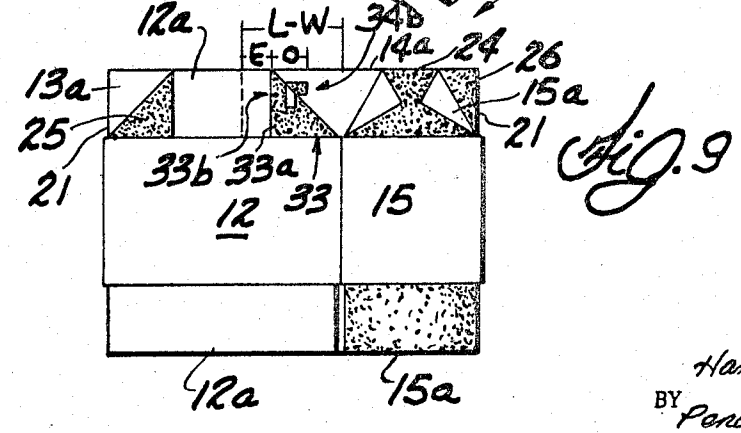


Fig. 9



INVENTOR.
Hamilton Johnson
BY Pendleton, Neuman, Seibold & Williams
Attorneys

United States Patent Office

3,276,664
Patented Oct. 4, 1966

3,276,664

ADHESIVE PATTERN FOR SELF-SEALING CONTAINER

Hamilton Johnson, Grand Rapids, Mich., assignor to Packaging Corporation of America, Evanston, Ill., a corporation of Delaware

Filed Oct. 23, 1965, Ser. No. 503,277
8 Claims. (Cl. 229—48)

This invention relates to self-sealing rectangular containers wherein the ratio of the length of the side to the length of the end is greater than zero and less than two. More particularly, it relates to the adhesive pattern for sealing the end panel closure flaps and the side panel closure flaps to each other in such containers, and it is an object of the invention to provide an improved self-sealing adhesive pattern of this character.

It is a further object of the invention to provide an improved adhesive pattern for the end panel closure flaps and the side panel closure flaps of rectangular containers of the character indicated, whereby the containers can be stacked in the collapsed form without any part of a container sticking to itself, or to an adjacent collapsed container, while at the same time increasing the area of adhesive surface, and it is an object of the invention to provide an improved self-sealing adhesive pattern of this character.

The use of adhesive patterns in the end panel closure flaps and the side panel closure flaps to achieve stackability of collapsed rectangular containers when contact adhesive or self-sealing adhesive is used is known. Such adhesives are those which achieve sealing when two adhesive surfaces are brought together without more. That is, there is no need to dampen the adhesive surface, for example. Reference is made to Patents No. 2,874,891 to Kelsall, No. 3,116,008 to Green et al., and No. 3,184,-144, to Green et al., as typical examples of the teachings of the prior art. The self-sealing adhesive patterns of the prior art do not provide the largest area of adhesive surface available for sealing containers of the character involved in this application, and it is an object of the invention to remedy this deficiency.

It is a further object of the invention to provide an improved self-sealing adhesive pattern on the end panel closure flaps and the side panel closure flaps in stackable rectangular containers of the character indicated, wherein the maximum area of adhesive is utilized.

It is a further object of the invention to provide an improved self-sealing adhesive pattern on the end panel closure flaps and the side panel closure flaps in stackable rectangular containers of the character indicated, wherein only the overlapping adhesive pattern in the area of overlapping closure flaps in the stacked condition is digital in form.

In carrying out the invention in one form, there is provided an improvement in the adhesive pattern for sealing a collapsible and stackable self-sealing container having opposed side panels and end panels hingedly connected together in end-to-end relationship in a blank of sheet material, in which the ratio of the length of a side panel to the length of an end panel is greater than one and less than two. The side panel and end panel closure flaps extend from and are hingedly connected to the edges of each of said side panels and end panels. The flaps are substantially coextensive in length with respect to their connected panels. The widths of said end panel flaps are substantially equal to each other and less than one-half of the length of said side panel flaps. The widths of said side panel flaps are equal to each other and not greater than one-half of the length of said end panel flaps. The flaps in the collapsed position of the container are disposed in face-to-face contacting relationship whereby two or the diagonally opposed end portions of the respective side panel flaps are in overlapping contacting relationship with one another. A coating of self-sealing adhesive is applied to one surface of each of the end panel flaps. A continuous coating of self-sealing adhesive is applied to the opposite surface of each of the side panel flaps adjacent the ends thereof other than the said overlapping end portions. The adhesive coating applied to the overlapping end portions of the side panel flaps comprises a digital pattern wherein the adhesive coatings are interdigital with respect to each other.

In carrying out the invention according to another form, there is provided an improvement in the adhesive pattern for sealing a collapsible and stackable self-sealing container having opposed side panels and end panels hingedly connected together in end-to-end relationship in a blank of sheet material, in which the ratio of the length of a side panel to the length of an end panel is greater than one and less than two. In this form of blank, side panel and end panel closure flaps extend from and are hingedly connected to the edges of each of said side panels and end panels. The flaps are substantially coextensive in length with respect to their connected panels, and the widths of said end panel and side panel closure flaps are substantially equal to each other and not greater than one-half of the length of said end panel flaps. The flaps in the collapsed position of the container are disposed in face-to-face contacting relationship whereby two of the diagonally opposed end portions of the respective side panel flaps are in overlapping contacting relationship with one another. A coating of self-sealing adhesive is applied to substantially all of the outer surface of each of said end panel flaps, and a substantially rectangular coating of self-sealing adhesive is applied to the inner surface of each of the side panel flaps adjacent the ends thereof other than the said overlapping end portions along the edges of said side panel flaps. The width of the coating is substantially equal to the width of said side panel flaps and the length of the coating is substantially equal to the width of said end panel flaps. An adhesive coating of a digital pattern is applied to the inner surface of and extends along the edges of each of the overlapping end portions of said side panel flaps. The width of each of said digital pattern coatings is substantially equal to the width of the side panel flap and the length of each digital pattern coating is substantially equal to one-half the length of the end panel flap thereby providing an overlapping adhesive portion having a length equal to L minus W in the range of lengths of L minus W from equal to greater than zero to equal to one-half W or having a length equal to one-half W diminished by the overlap excess factor in the range of lengths of L minus W equal to one-half W to equal to just less than W, wherein the digital pattern coatings in the areas of said overlapping adhesive portions on said overlapping flap portions are in strips of adhesive separated by alternate strips of no adhesive, and said strips of adhesive on one overlapping adhesive portion alternate with the strips of adhesive on the other overlapping adhesive portion.

For a better understanding of the invention, reference should be had to the accompanying drawings in which three forms of the invention are shown, respectively, in FIGS. 1, 2 and 3, FIGS. 4, 5 and 6, and FIGS. 7, 8 and 9.

FIGURE 1 is a perspective view of a rectangular container, according to the invention, in which the ratio of the length of a side panel to the length of an end panel is equal to one and one-half;

FIG. 2 is a fragmentary view of the blank of FIG. 1 on a smaller scale, laid out flat and viewed from the interior of the container;

FIG. 3 is a view showing the blank of FIG. 2 folded into the collapsed tubular form after the free ends of the blank have been attached together;

FIG. 4 is a perspective view similar to FIG. 1 of a rectangular container in which the ratio of the length of a side panel to the length of an end panel is equal to about one and one-quarter;

FIG. 5 is a view similar to FIG. 2, showing a modified adhesive pattern applied to the closure flaps so as to form the container of FIG. 4;

FIG. 6 is a view similar to FIG. 3, but showing the blank of FIG. 5 folded into a collapsed tubular form;

FIG. 7 is a perspective view similar to FIG. 1 of a rectangular container in which the ratio of the length of a side panel to the length of an end panel is equal to about one and three-quarters;

FIG. 8 is a view similar to FIGS. 2 and 5, but showing a second modified adhesive pattern applied to the closure flaps so as to form the container of FIG. 7; and

FIG. 9 is a view similar to FIGS. 3 and 6, but showing the container of FIG. 7 in a collapsed tubular form.

Referring more particularly to the drawings and to the form of the invention shown in FIGS. 1, 2 and 3, it will be observed that the container **10** may be of a regular slotted style and formed from a blank **11** of doubled faced corrugated fibreboard material. The blank includes a side panel **12**, an end panel **13**, a side panel **14** and an end panel **15** connected together along the scored lines **16**, **17** and **18**. Side closure flaps **12***a* and **14***a* are attached along scored lines to and are substantially coextensive with the side panels **12** and **14**, respectively. Similarly end closure flaps **13***a* and **15***a* are attached along scored lines to and are substantially coextensive with the end panels **13** and **15**, respectively. Correspondingly, side and end closure flaps are shown in the other edges of the side and end panels but these will not be specifically referred to since the invention can be understood by considering only one series of side and end closure flaps. Appropriate slots **19** are provided between the side panel closure flaps and the end panel closure flaps, as shown, and a cutout portion **21** is provided on the side and end closure panel flaps at the free ends of the blank, as may be seen in FIG. 2, in order that when the container blank is set up the side and end closure flaps may be folded to their closed positions without interference, or in the event the container is not properly squared up there would be no edge portion of the overlapping flap projecting beyond the exposed surfaces of the side or end panels.

The blank of FIG. 2 is placed into the collapsed form of FIG. 3 by folding end panel **15** over side panel **14**, by folding side panel **12** over end panel **13**, and by applying a strip of tape **22** (a manufacturers joint) to adjoining edge portions of panels **12** and **15**. The collapsed containers, as shown in FIG. 3, are stacked onto each other for shipping purposes. At the point of use each flattened container is formed into the rectangular configuration, the bottom end closure flaps **13***a* and **15***a* are initially folded inwardly toward each other, and the bottom side closure flaps **12***a* and **14***a* are then folded over to overlie the end closure flaps **13***a* and **15***a*. After the container has been loaded the same folding procedure is followed with respect to the top closure flaps.

For understanding the terminology used throughout this application, it will be understood that the length of the container (L) will be the length of any side panel, and the width of the container (L) will be the length of any side panel, and the width of the container (W) will be the length of any end panel, as seen in FIGS. 1, 4 and 7. Thus, the length of a side panel closure flap is substantially the length of the attached side panel, and the length of an end closure flap is substantially the length of the attached end panel. The widths of the side and end closure flaps are therefore the other transverse dimensions of these parts. In the form shown the widths of the side closure flaps **12***a* and **14***a* and the widths of the end closure flaps **13***a* and **15***a* are all equal to each other and equal to about one-half of the length of an end panel. In this manner the side closure flaps **12***a* and **14***a* when folded toward each other in the open position of the container will have their edges abutting each other, but as shown the edges of the end closure flaps **13***a* and **15***a* leave a gap between them which can be eliminated, if desired by making these members wider.

Coatings **23** and **24** of self-sealing or contact adhesive (self-sealing adhesives) or the like are applied to the outer surfaces of end closure flaps **13***a* and **15***a*, respectively, as may be seen in FIG. 1; these coatings of adhesive being spread over substantially the total surfaces of these flaps by any suitable applicating equipment. To the opposing sides of side closure flaps **12***a* and **14***a* (i.e., the inside surfaces of these flaps, as may be visualized best in FIG. 1), there is applied a pattern of adhesive, according to the invention, which provides the maximum of adhesive surface for sealing the flaps together in their closed positions, while permitting the collapsed container to be stacked without having the adhesive surfaces adhere to each other or to an adjacent stacked collapsed container.

Thus, there is applied solid substantially rectangular areas **25** and **26** of self-sealing adhesive to one end of each side panel flaps **12***a* and **14***a*, respectively, the areas **25** and **26** being at the ends of one diagonal position of the container in use. In keeping with the purpose of achieving maximum adhesive area, there is applied to the opposite ends of side panel flaps **12***a* and **14***a*, digital patterns of self-sealing adhesive **27** and **28**, respectively. The areas of adhesives **25** and **26** are essentially determined by the associated edges of flaps **12***a* and **14***a*, but the inward edges **25***a* and **26***a* of the adhesive are essentially in line with the inward edges of the end panel closure flaps **23** and **24**. Similarly, the inward edge **27***a* of adhesive pattern **27** and the inward edge **28***a* of adhesive pattern **28** are essentially in line with the inward edges of end panel closure flaps **15***a* and **13***a*, respectively. There is, therefore, an area between the edges **25***a* and **27***a* of the adhesive patterns on flap **12***a* which is free of adhesive. Similarly, there is an adhesive free space between the edges **26***a* and **28***a* of the adhesive patterns on flap **14***a*. Since the adhesive areas **25**, **26**, **27** and **28** extend to the inward edges of flaps **13***a* and **15***a*, respectively, there is no need for adhesive in the adhesive free areas. An economy in the use of adhesive is, therefore, achieved.

If the width of each of the flaps **13***a* and **15***a* is increased so that the inner edges thereof come closer to each other, as may be visualized in FIG. 1, the lengths of the adhesive patterns on the side panel flaps **12***a* and **14***a* can be increased correspondingly so that the adhesive portions **25**, **26**, **27** and **28** are coextensive with the widths of the flaps **13***a* and **15***a*.

Referring to FIG. 3 in which the container of FIG. 1 is shown collapsed to a flat condition suitable for stacking, such as when the containers are stored, it will be seen that that portion of flap **12***a*, including the digital adhesive pattern **27**, overlaps that portion of flap **14***a* including the alternate adhesive pattern **28**. The digital adhesive pattern **27** begins on the outer edge of flap **12***a* with a finger or bar of adhesive followed by a finger or bar of no adhesive. This pattern is continued whereby the pattern **27** consists of alternate bars or fingers of adhesive and adhesive free areas. Similarly, the digital pattern **28** on flap **14***a* consists of alternate bars or fingers of adhesive and adhesive free areas but the bar or finger adjacent the edge of flap **14***a* is an adhesive free area. Thus, as may be visualized best in FIG. 3, the adhesive fingers of digital pattern **28** come opposite the adhesive free fingers of digital pattern **27**. The fingers of adhesive, conveniently may be somewhat narrower than the fingers of no adhesive. There is, therefore, no adherence between these two digital adhesive patterns when the container is in the collapsed condition. Also, as may be seen in FIG. 3, the adhesive surface **25** overlies the interior

of flap 13*a* and, thus, there is no adhesive in contact with other adhesive and, therefore, no occasion for flap 12*a* to adhere to flap 13*a*. Similarly, the adhesive surface 24 of flap 15*a* is on the opposite side of the blank from adhesive surface 26, and consequently no occasion for any adherence to take place between flaps 15*a* and 14*a* in the collapsed condition of the container.

The extent of the overlap between the flap 12*a* and 14*a* at the digital adhesive patterns 27 and 28 is essentially equal to L minus W ($L-W$) when L is equal to one and one-half W, L being the length of the container and W being its width, bearing in mind that slots are cut from the various flaps for the purpose already pointed out. The overlap L minus W is also equal to the length of the digital pattern in this form of container according to the invention.

Since the adhesive areas 25 and 26 do not overlie any other adhesive areas in the collapsed condition of the container, adhesive surfaces 25 and 26 may be solid, and since the adhesive areas 27 and 28 overlap each other in the collapsed condition of the container, these patterns are digital as already explained. The maximum total surface available for adhesive on flaps 12*a* and 14*a* is, therefore, used, resulting in a stronger and more useful container.

Referring to FIGS. 4, 5 and 6, there is shown a form of container in which the length L is greater than the width W and is less than one and one-half W. Specifically, according to these figures, the length L is about equal to one and one-quarter W.

Comparing FIGS. 4, 5 and 6 with FIGS. 1, 2 and 3, it will be observed that certain parts of the containers of the two sets of figures are the same essentially, and for this reason, these parts will bear the same reference characters. Thus, the side panels 12 and 14, the end panels 13 and 15, the side panel closure flaps 12*a* and 14*a*, and the end panel closure flaps 13*a* and 15*a* are correspondingly numbered to the parts in the FIGS. 1, 2 and 3. The essential difference between the containers of FIGS. 4, 5 and 6, and FIGS. 1, 2 and 3, is in the adhesive patterns at the left-hand ends of closure flaps 12*a* and 14*a*, including the digital portion thereof, as viewed in FIG. 5. These patterns of adhesive are given the reference characters 31 and 32 and include solid portions 31*a* and 32*a*, respectively, and digital portions 31*b* and 32*b*, respectively.

The left-hand edge of panel 12 is folded around and attached to the right-hand edge of panel 15, as viewed in FIG. 5, with a manufacturers joint 22 similar to that of the container of FIG. 1.

In the collapsed condition for storage and shipment, as may be seen in FIG. 6, the overlap of the adhesive patterns 31 and 32 of closure flaps 12*a* and 14*a* (L minus W), is equal to the length of the digital portions 31*b* or 32*b*, whereas the total adhesive patterns 31 and 32 are greater in length by the length of the solid portions 31*a* and 32*a*. It will be observed (FIG. 4) that the adhesive pattern 31 of flap 12*a* with its solid portion 31*a* and its digital portion 31*b* extends over substantially one-half of the adhesive surface 24 of flap 15*a*. Similarly, the total adhesive surface 32 of flap 14*a* with its solid portion 32*a* and its digital portion 32*b* extends over substantially one-half of the adhesive pattern 23 on flap 13*a*. The inner extent of adhesive patterns 31 and 32 is substantially in line with the inward edges of flaps 15*a* and 13*a*, respectively. The digital portion 31*b* of the adhesive pattern 31 alternate fingers or bars of adhesive and bars of adhesive free areas, the pattern beginning with an adhesive finger or bar at the corner of flap 12*a*, as may be seen in FIGS. 4 and 5. Similarly, the digital pattern 32 has alternate fingers or bars of adhesive and adhesive free areas beginning at the corner of the flap 14*a* with an adhesive free area. Thus, as may be observed in FIG. 6, when the flaps 12*a* and 14*a* overlap each other the bars of adhesive area on one flap come opposite a bar of non-adhesive area on the other flap thereby removing any tendency for these two flaps to adhere to each other while the containers are disposed in the collapsed condition.

The other flaps in the form of the containers shown in FIGS. 4, 5 and 6, do not adhere to each other in the collapsed condition, as already pointed out in connection with the form of container shown in FIGS. 1, 2 and 3.

The adhesive surfaces 25 and 26 are solid and, thus, present a full adhesive area to the adhesive surfaces 23 and 24. The solid portions 31*a* and 32*a* present full adhesive areas to the adhesive surfaces 24 and 23. These solid adhesive areas together with the digital adhesive areas 31*a* and 32*a* make for the maximum use of adhesive area and a stronger container.

Referring to FIGS. 7, 8 and 9, there is shown a further form of the invention in which the length L is greater than the width W and is less than twice W. Specifically, according to these figures, the length L is about equal to one and three-quarters W.

Comparing FIGS. 7, 8 and 9 with FIGS. 1, 2 and 3, and FIGS. 4, 5 and 6, it will be observed that certain parts of the containers of the three sets of figures are the same, essentially, and for this reason, these parts will bear the same reference characters. Thus, the side panels 12 and 14, the end panels 13 and 15, the side panel closure flaps 12*a* and 14*a*, and the end panel closure flaps 13*a* and 15*a* are correspondingly numbered to the parts in FIGS. 1, 2 and 3, and FIGS. 4, 5 and 6. The essential difference between the containers of FIGS. 7, 8 and 9, and the preceding figures is in the adhesive patterns at the left-hand ends of closure flaps 12*a* and 14*a* including the digital portions thereof, as viewed in FIG. 8. These patterns of adhesive are given the reference characters 33 and 34 and include solid portions 33*a* and 34*a*, respectively, and digital portions 33*b* and 34*b*, respectively.

The left-hand edge of panel 12 is folded around and attached to the right-hand edge of panel 15, as viewed in FIG. 8, with a manufacturers joint 22 (FIGS. 7 and 9), similarly to the containers of the preceding sets of figures.

In the collapsed condition for storage and shipment, as may be seen in FIG. 9, the overlap O of the adhesive patterns 33 and 34 of closure flaps 12*a* and 14*a* is equal to the length of the digital portions 33*a* and 34*a*. The total overlap of the closure flaps 13*a* and 14*a* is equal to L minus W which exceeds the overlap O and also exceeds the length of either adhesive pattern 33 and 34. L minus W is equal in length to the combined lengths of the solid portions of adhesive 33*a*, 34*a* less either of the digital portions 33*b* and 34*b*.

It will be observed (FIG. 7) that the adhesive pattern 33 of flaps 12*a* with its solid portion 33*a* and its digital portion 33*b* extends over substantially one-half of the adhesive surface 24 of flap 15*a*. Similarly, the total adhesive surface 34 of flap 14*a* with its solid portion 34*a* and its digital portion 34*b* extends over substantially one-half of the adhesive pattern 23 on flaps 13*a*. The inner extent of adhesive patterns 33 and 34 are substantially in line with the inward edges of flaps 15*a* and 13*a*, respectively. The digital portion 33*b* of the adhesive pattern 31 has alternate fingers or bars of adhesive and bars of adhesive free areas, the pattern beginning with an adhesive finger or bar spaced inwardly from the corner of flap 12*a*, as may be seen in FIGS. 7 and 8. Similarly, the digital pattern 34*b* has alternate fingers or bars of adhesive and adhesive free areas beginning at a point spaced inwardly from the corner of the flap 14*a* with an adhesive free area. Thus, as may be observed in FIG. 9, when the flaps 12*a* and 14*a* overlap each other the bars of adhesive area on one flap come opposite a bar of non-adhesive area on the other flap thereby removing any tendency for these two flaps to adhere to each other while the containers are disposed in the collapsed condition.

The other flaps in the form of the containers shown in FIGS. 7, 8 and 9, do not adhere to each other in the collapsed condition, as already pointed out in connection with the form of container shown in the preceding figures.

The adhesive surfaces 25 and 26 are solid and, thus,

present a full adhesive area to the adhesive surfaces **23** and **24**. The solid portions **33***a* and **34***a* present full adhesive areas to the adhesive surfaces **24** and **23**. These solid adhesive areas together with the digital adhesive areas **33***b* and **34***b* make for the maximum use of adhesive area and a stronger container.

Referring to FIG. 9, it will be observed that the length of the overlapping or digital portion O of this form of container is related to L minus W, in other words, to the ratio of the length to the width of the container itself. The amount of overlap or length O of digital pattern required, according to the invention, with respect to the construction of FIGS. 7, 8 and 9, may be defined as $(W/2-E)$ where W is the container width and E is the overlap excess factor. E, as shown in FIG. 9 is equal to the length of the solid portion **34***a* of adhesive pattern **34**. In the range where L minus W varies from equal to one-half W to just less than W the overlap excess factor is equal to the expression $W(L/W-3/2)$ where L is the container length and W is its width.

When L minus W becomes equal to W there is no longer any overlap of the adhesive patterns.

While particular embodiments of the invention have been shown, it will be understood, of course, that the invention is not limited thereto since many modifications may be made, and it is, therefore, contemplated by the appended claims to cover any such modifications as fall within the true spirit and scope of the invention.

The invention having thus been described, what is claimed and desired to be secured by Letters Patent is:

I claim:

1. In an adhesive pattern for sealing a collapsible and stackable self-sealing container having opposed side panels and end panels hingedly connected together in end-to-end relationship in a blank of sheet material, in which the ratio of the length of a side panel to the length of an end panel is greater than one and less than two, side panel and end panel closure flaps extending from and hingedly connected to the edges of said side panels and end panels respectively, said flaps being substantially coextensive in length with respect to their connected panels, the widths of said end panel closure flaps being substantially equal to each other and less than one-half of the length of said side panel flaps, the widths of said side panel closure flaps being substantially equal to each other and not greater than one-half of the length of said end panel closure flaps, said flaps in the collapsed position of the container being disposed in face-to-face contacting relationship whereby two of the diagonally opposed end portions of the respective side panel closure flaps are disposed in overlapping contacting relationship with one another, a coating of self-sealing adhesive applied to one surface of each of said end panel closure flaps, a continuous coating of self-sealing adhesive applied to the opposed surface of each of said side panel closure flaps adjacent the ends thereof other than the said overlapping end portions, the improvement comprising a digital pattern coating of self-sealing adhesive applied to the opposed surfaces of said overlapping end portions of said side panel flaps, wherein the adhesive digital pattern coatings in the areas of said overlapping adhesive portions on said overlapping flap portions are interdigital with respect to each other.

2. The improvement recited in claim **1** characterized in that the length of each of said digital pattern coatings is substantially equal to the length of said end panel flaps.

3. The invention according to claim **1** characterized in that the digital pattern coating of self-sealing adhesive is applied to the opposed surface of and extends along the edges of each of said overlapping end portions of said side panel closure flaps and is substantially equal to the width of said side panel closure flaps and the length of each of said digital pattern coatings is substantially equal to one-half the length of said end panel closure flaps thereby to provide an overlapping adhesive portion on said overlapping end portions having one length equal to L minus W in the range of lengths of L minus W from equal to greater than zero to equal to one-half W and a second length equal to one-half W diminished by the overlap excess factor in the range of lengths of L minus W from equal to one-half W to equal to just less than W, and the digital pattern coatings in the areas of said overlapping adhesive portions on said overlapping flap portions are interdigital with respect to each other.

4. The invention according to claim **1** characterized in that the widths of said end panel and side panel closure flaps are substantially equal to each other and not greater than one-half of the length of said end panel closure flaps, the digital pattern coating of self-sealing adhesive is applied to the opposed surface of and extends along the edges of each of said overlapping end portions of said side panel closure flaps and is substantially equal to the width of said side panel closure flaps and the length of each of said digital pattern coatings is substantially equal to one-half the length of said end panel closure flaps thereby to provide an overlapping adhesive portion on said overlapping end portions having a length equal to L minus W in the range of lengths of L minus W from equal to greater than zero to equal to one-half W and having a length equal to one-half W diminished by the overlap excess factor in the range of lengths of L minus W from equal to one-half W to equal to just less than W, and the digital pattern coatings in the areas of said overlapping adhesive portions on said overlapping flap portions are interdigital with respect to each other.

5. The invention according to claim **1** characterized in that the widths of said end panel and side panel closure flaps are substantially equal to each other and not greater than one-half of the length of said end panel closure flaps, the coating of self-sealing adhesive applied to one surface of each of said end panel closure flaps is applied to the outer surface thereof and substantially over its entire extent, the coating of self-sealing adhesive applied to the opposed surface of each of said side panel closure flaps adjacent the ends thereof other than the said overlapping end portions is applied to the inner surface thereof and is substantially rectilinear in form, said rectilinear coatings extending along the edges of said side panel closure flaps and having a width substantially equal to the width of said side panel closure flaps and a length substantially equal to the width of said end closure panel flaps, the digital coating of self-sealing adhesive is applied to the inner surface of and extends along the edges of each of said overlapping end portions of said side panel closure flaps and is substantially equal to the width of said side panel closure flaps and the length of each of said digital pattern coatings is substantially equal to one-half the length of said end panel closure flaps thereby to provide an overlapping adhesive portion on said overlapping end portions having a length equal to L minus W in the range of lengths of L minus W from equal to greater than zero to equal to one-half W and having a length equal to one-half W diminished by the overlap excess factor in the range of lengths of L minus W equal to one-half W to equal to just less than W, the digital pattern coatings in the areas of said overlapping adhesive portions on said overlapping flap portions are in strips of adhesive separated by alternate strips of no adhesive, and said strips of adhesive on one overlapping adhesive portion alternate with the strips of adhesive on the other overlapping adhesive portion.

6. The invention according to claim **1** characterized in that the widths of said end panel and side panel closure flaps are substantially equal to each other and not greater than one-half of the length of said end panel closure flaps, the coating of self-sealing adhesive applied to one surface of each of said end panel closure flaps is applied to the outer surface thereof and substantially over its entire extent, the coating of self-sealing adhesive applied

to the opposed surface of each of said side panel closure flaps adjacent the ends thereof other than the said overlapping end portions is applied to the inner surface thereof and is substantially rectilinear in form, said rectilinear coatings extending along the edges of said side panel flaps and having a width substantially equal to the width of said side panel closure flaps and a length substantially equal to the width of said end panel closure flaps, the digital pattern coating of self-sealing adhesive is applied to the inner surface of and extends along the edges of each of said overlapping end portions of said side panel closure flaps and is substantially equal to the width of said side panel closure flaps and the length of each of said digital pattern coatings is substantially equal to one-half the length of said end panel closure flaps thereby to provide an overlapping adhesive portion on said overlapping end portions having a length equal to L minus W in the range of lengths of L minus W from equal to greater than zero to equal to one-half W, the digital pattern coatings in the areas of said overlapping adhesive portions on said overlapping flap portions are in strips of adhesive separated by alternate strips of no adhesive, and said strips of adhesive on one overlapping adhesive portion alternate with the strips of adhesive on the other overlapping adhesive portion.

7. The invention according to claim 1 characterized in that the widths of said end panel and side panel closure flaps are substantially equal to each other and not greater than one-half of the length of said end panel closure flaps, the coating of self-sealing adhesive applied to one surface of each of said end panel closure flaps is applied to the outer surface thereof and substantially over its entire extent, the coating of self-sealing adhesive applied to the opposed surface of each of said side panel closure flaps adjacent the ends thereof other than the said overlapping end portions is applied to the inner surface thereof and is substantially rectilinear in form, said rectilinear coatings extending along the edges of said side panel closure flaps and having a width substantially equal to the width of said side panel closure flaps and a length substantially equal to the width of said end panel closure flaps, the digital pattern coating of self-sealing adhesive is applied to the inner surface of and extends along the edges of each of said overlapping end portions of said side panel closure flaps and is substantially equal to the width of said side panel closure flaps and the length of each of said digital pattern coatings is substantially equal to one-half the length of said end panel closure flaps thereby to provide an overlapping adhesive portion on said overlapping end portions having a length equal to L minus W, the digital pattern coatings in the areas of said overlapping adhesive portions on said overlapping flap portions are in strips of adhesive separated by alternate strips of no adhesive, and said strips of adhesive on one overlapping adhesive portion alternate with the strips of adhesive on the other overlapping adhesive portion.

8. The invention according to claim 1 characterized in that the widths of said end panel and side panel closure flaps are substantially equal to each other and not greater than one-half of the length of said end panel closure flaps, the coating of self-sealing adhesive applied to one surface of each of said end panel closure flaps is applied to the outer surface thereof and substantially over its entire extent, the coating of self-sealing adhesive applied to the opposed surface of each of said side panel closure flaps adjacent the ends thereof other than the said overlapping end portions is applied to the inner surface thereof and is substantially rectilinear in form, said rectilinear coatings extending along the edges of said side panel closure flaps and having a width substantially equal to the width of said side panel closure flaps and a length substantially equal to the width of said end panel flaps, the digital pattern coating of self-sealing adhesive is applied to the inner surface of and extends along the edges of each of said overlapping end portions of said side panel flaps and is substantially equal to the width of said side panel closure flaps and the length of each of said digital pattern coatings is substantially equal to one-half the length of said end panel closure flaps thereby to provide an overlapping adhesive portion on said overlapping end portions having a length equal to one-half W diminished by the overlap excess factor in the range of lengths of L minus W equal to one-half W to equal to just less than W, the digital pattern coatings in the areas of said overlapping adhesive portions on said overlapping flap portions are in strips of adhesive separated by alternate strips of no adhesive, and said strips of adhesive on one overlapping adhesive portion alternate with the strips of adhesive on the other overlapping adhesive portion.

References Cited by the Examiner

UNITED STATES PATENTS

2,217,757	10/1940	Lindley	229—37
2,521,989	9/1950	McPherson	229—23
2,896,836	7/1959	Bergstein	229—37
2,998,180	8/1961	Dehoney	229—43
3,116,008	12/1963	Greene et al.	229—48

GEORGE O. RALSTON, *Primary Examiner.*