

Oct. 9, 1956

R. M. GOLDSTEIN

2,765,973

MAILING OR SHIPPING CARTON

Filed Feb. 28, 1950

3 Sheets-Sheet 1

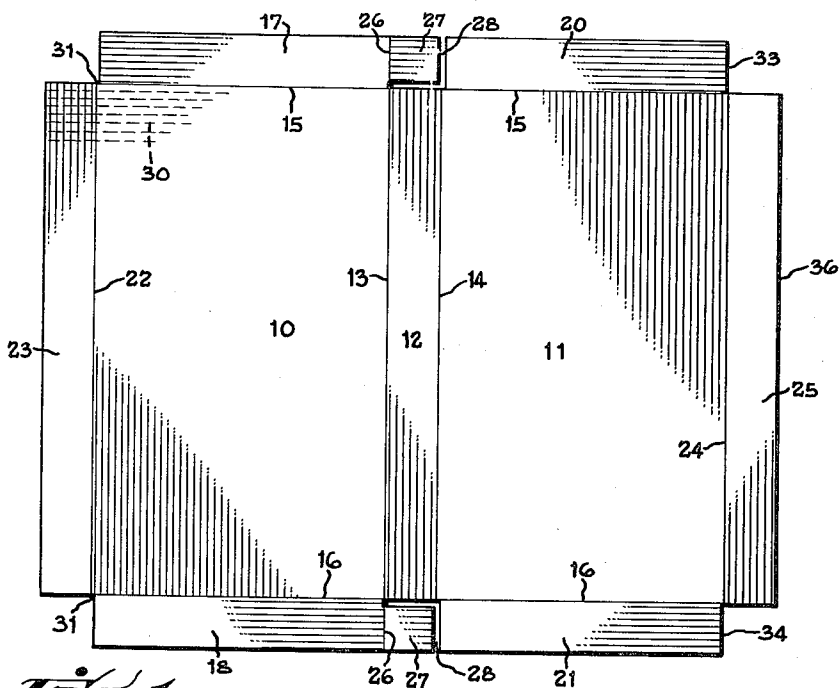


Fig. 1

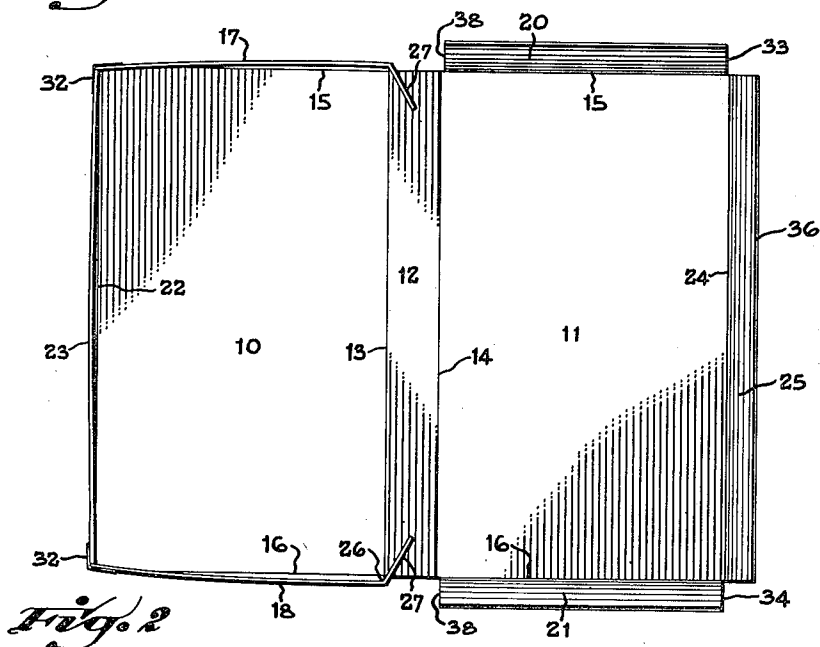


Fig. 2

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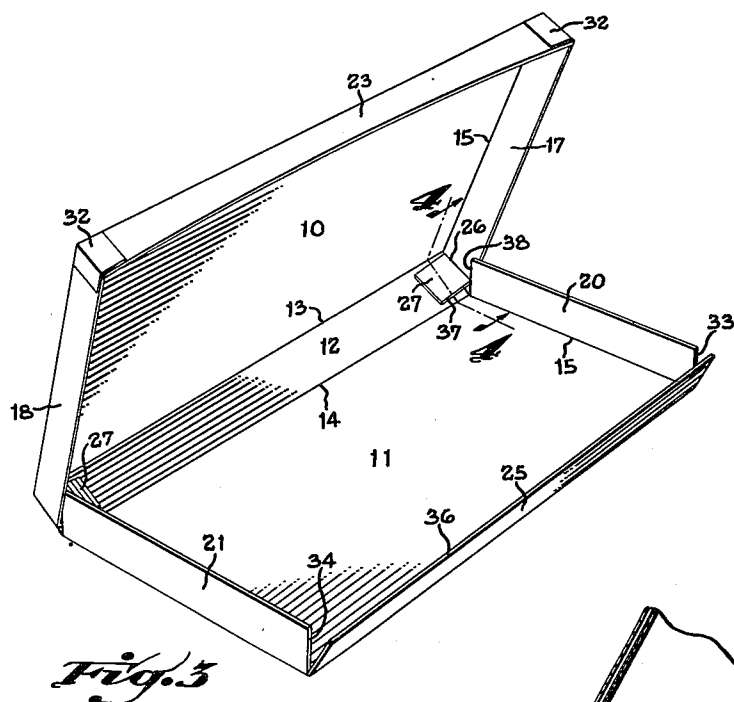
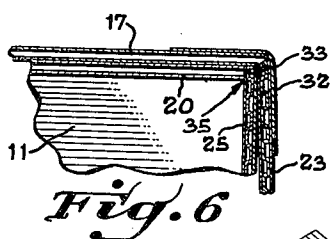
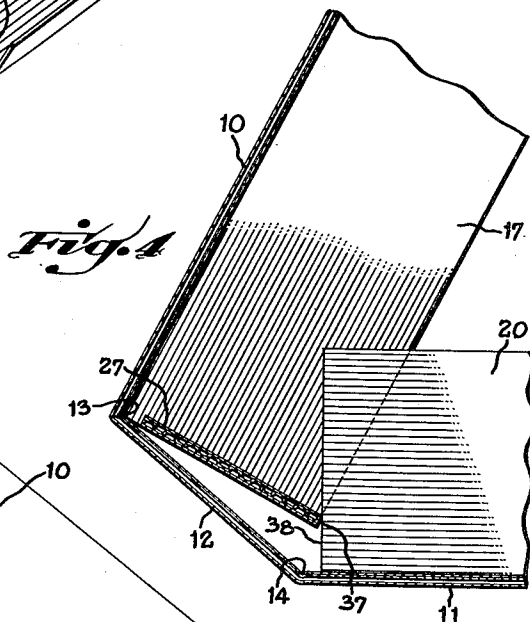
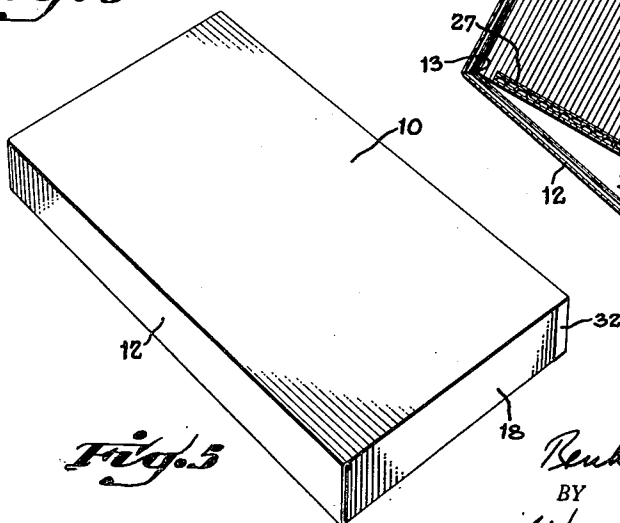
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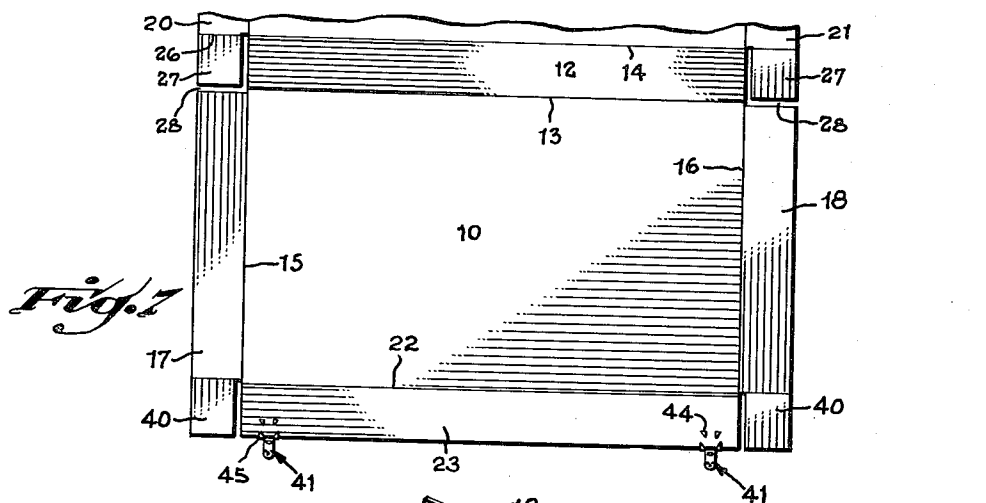
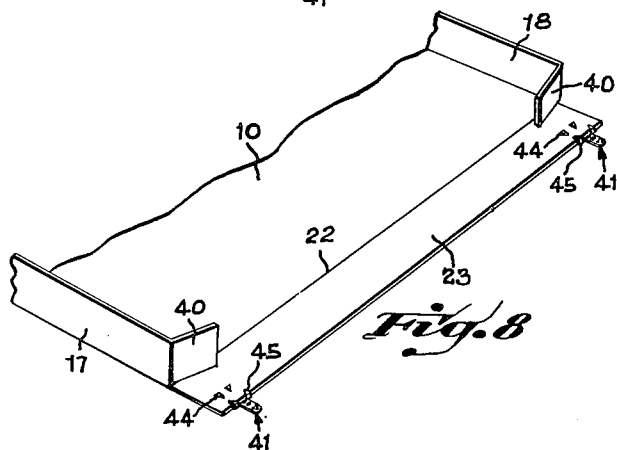
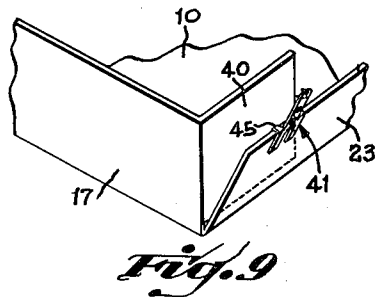
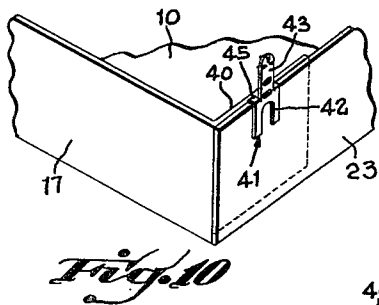
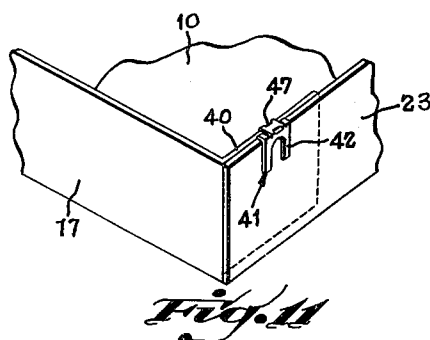
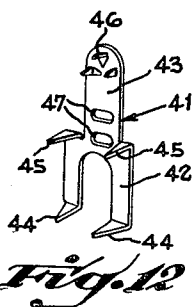
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3 Sheets-Sheet 3



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2,765,973

MAILING OR SHIPPING CARTON

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Application February 28, 1950, Serial No. 146,831

3 Claims. (Cl. 229—33)

This invention is directed to a corrugated box of improved construction which is designed to meet the need of large mail order houses for a strong and attractive shipping or mailing carton suitable for assembly line techniques of packaging.

In the packaging departments of mail order houses, a premium is put on speed. Thus, in order to meet the demands of these operating conditions, it is required that the shipping carton or box be constructed so that it can be set up speedily, that is, made ready to receive the articles to be shipped, and once the goods have been placed inside it, closed with a minimum of handling. In addition, the box must be either sealed or locked in some manner so that it remains closed during subsequent handling operations.

Heretofore, light cardboard boxes of the type in which the side walls fold inwardly onto the top and bottom panels have been utilized, the advantage to these boxes being that they can be set up in a matter of seconds. This type box lends itself well to assembly line techniques for packaging, but it is less than completely satisfactory because it is easily crushed and usually arrives at the customer's home in an unsightly condition after its trip through the mails. Another disadvantage is that this box is so thin that the merchandise inside it is often times damaged in transit.

The present carton also can be set up, filled and closed in a matter of seconds, as required by the established techniques; but in addition, it is unusually strong and well able to withstand the rigors of parcel post shipment. In fact, the present box is sufficiently resistant to crushing to support the weight of an average size adult standing on the corners of the box. The box has the further advantage in that it may be shipped through the mails without additional wrapping, as is required by the light cardboard boxes of the type utilized heretofore. Furthermore, the carton is light in weight, a fact easily appreciated by mail order houses, operating on comparatively small profit margins, where mailing costs must be kept at a minimum.

Of course, in order to be practical the box must be economical to manufacture. With this in mind, the inventor has designed the box so that it may be formed from a flat blank of ordinary corrugated paper which may be stamped out by conventional methods. As a further economy factor the scoring and cutting lines of the blank are all straight and the box can be made on existing machines without the added cost of specially shaped dies.

In the present box all of the inherent characteristics of corrugated paper are utilized to advantage. For example, corrugated paper is unusually resistant to crushing in the endwise direction of the lines of corrugation, in other words, against the grain. Mindful of this particular characteristic, the inventor blanks out the box so that the corrugated lines in the finished box extend in the crush resistant direction at all of the critical places where crushing is likely to occur. For another thing, when corrugated paper is cut, either across or with the grain, a

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somewhat rough edge results. The inventor utilizes this characteristic of corrugated paper to provide friction locks in the box, not only for locking the box when it is closed, but also for locking the box in a semi-open position, which position may be utilized when the box is being filled with merchandise. These locks, and particularly the lock which is provided for maintaining the carton in the completely closed condition, are the outstanding features of the carton.

The inventor does not depend on friction alone in order to effect locking, but designs the carton to take advantage of another characteristic of corrugated paper in order to tension the parts constituting the locking surfaces. When the box is scored during the blanking out operation, the depth of the score lines is controlled so that the fibers of the corrugated material are not completely broken and a marked tendency remains for the flaps constituting the side and end walls of the carton to spring back toward the flattened condition. When the box is completed, the springiness of the material and its remarkable resistance to warping provide forces which are directed to the locking surfaces, where they are concentrated to increase many times over the friction between the parts.

In the preferred embodiment, the box is blanked out with a top section and a bottom section, the two being joined at a common side wall. Both sections are substantially symmetrical. The top section includes a central panel with end and side wall flaps attached along the respective edges, the same elements being included in the lower section. The only operation required in order to complete the box after it is blanked out, is the fastening of the end walls to the side wall at the two outer corners in the top section. The wall members of the lower section are not fastened. In fact, one of the distinguishing features of the present carton is that such fastening is unnecessary.

In general, two methods of securing the corners of the upper section of the carton are contemplated. Both methods provide efficient locking, and the selection of one over the other is a matter of choice dependent upon the packaging technique employed by the user. In one method the corners of the upper section are secured together by means of adhesive coated tape. The tape may be affixed by the manufacturer of the carton and supplied to the ultimate user in this condition with the lower section laying out flat. In order to conserve shipping space the upper sections of the cartons may be nested one within the other, the cartons being stacked up in this fashion into conveniently handled bundles. In order to close the carton when it is supplied in this condition, all that is required is that the walls of the bottom section be bent upwardly and the top section swung down over them. Alternatively, when tape is utilized, the boxes may be shipped by the manufacturer in the closed condition. Upon receiving the closed carton, the packager simply raises the upper section to the semi-opened position discussed above, the box being self-locking in this position, the carton filled and then closed.

In the other method contemplated, the boxes are shipped in flat, sheet form. This method is suggested where it is necessary to ship the new cartons any great distance, the flat sheets taking up less space, thus conserving shipping costs. In this instance, corner staples or clips are utilized. The preferred form of staple is one which is adapted to be affixed by the manufacturer to one of the two parts to be joined while the carton is flat. The carton is designed so that the corners of the upper section can be formed and joined by these staples at the same time that the carton is to be filled with merchandise. The staple fastening can be accomplished very easily and quickly so that this second method also is adapted to assembly line techniques of packaging.

The particulars of the locking features of the box and the other advantages of the specific carton construction taught by the inventor will be discussed in greater detail in the following description of the drawings, in which:

Figure 1 is a top plan view showing the cardboard paper blank from which the box is formed.

Figure 2 is a view similar to Figure 1 in which the two end walls and the side wall of the top half of the box are folded up and joined at the two corners. This figure is somewhat diagrammatic in that the corrugations in the material of the box are not shown.

Figure 3 is a perspective view of the box in a partially closed condition in which it is ready to receive the merchandise. This figure is also somewhat diagrammatic.

Figure 4 is a fragmentary cross sectional view taken on line 4—4 in Figure 3.

Figure 5 is a perspective view of the box showing it when closed.

Figure 6 is a fragmentary cross sectional view illustrating the manner in which the two halves of the box lock together when closed.

Figure 7 is a fragmentary top plan view turned ninety degrees from the blank shown in Figure 1, showing a modified form of the fastening means employed for securing the corners of the upper section.

Figures 8, 9, 10 and 11 are diagrammatic views illustrating the step-by-step fastening of the corners of the carton shown in Figure 7.

Figure 12 is a perspective view showing the details of construction of the modified form of fastening means.

The blank from which the box is formed is shown in Figure 1 of the drawing. This view shows the corrugated paper blank after it has been cut and scored. The numerals 10 and 11 designate the top and bottom panels of the box respectively, these two panels being joined by a side wall member 12. Near the center the blank material is scored as at 13 and 14. These lines define the common side wall member 12. The respective ends of the panels 10 and 11 are defined by the score lines 15 and 16 which extend at right angles to the score lines 13 and 14. It will be noted that score lines 15 and 16 are continuous from panel 10 to panel 11 and extend in straight lines. At the two ends of the top panel 10, the respective score lines 15 and 16 define a pair of end walls 17 and 18. The score lines 15 and 16 also define end walls 20 and 21 at the respective ends of the bottom panel 11. On the top panel 10 a score line 22 along the one side defines a side wall 23 and a corresponding score line 24 on panel 11 defines a side wall 25.

It will be noted that the structure thus far described is symmetrical, and that all lines are straight with the respective parts on the top panel having counter parts in the bottom panel. The top section of the carton differs from the lower section of the carton in only two respects. The top is slightly wider by an amount equal to two thicknesses of the corrugated material, and in addition the inner ends of walls 17 and 18 terminate at the score lines 26 which define tabs 27, the respective tabs being set off from the end walls 20 and 21 of the bottom panel and from the common side wall 12 by the right angular slots 28.

The blank is cut from ordinary corrugated paper, and in the preferred embodiment the lines of corrugation, indicated diagrammatically at 30, extend parallel with the score lines 15 and 16. It is preferred that the corrugation lines extend in this particular direction for the reasons discussed below.

In order to complete the box, the only thing required is that the respective end walls 17 and 18 of the top portion of the box be turned up and joined at the corners 31—31 to the ends of turned up side wall 23 by adhesive coated tape, as shown at 32 or other fastening means known in the art.

In order to close the box part way to the position shown in Figure 3, the top portion is folded upwardly on score

lines 13 and 14, with the end walls 20 and 21 of the lower portion disposed on the insides of the respective end walls 17 and 18 on the top of the box. Also at this time the two tabs 27—27 on the respective end walls 17 and 18 are bent inwardly to rest against the inside face of the common side wall 12. This can be accomplished in a matter of seconds with little practice. In fact, it has been found that the present box can be set up and made ready for filling just as rapidly as the thin cardboard boxes utilized in the past. To close the box from this position, the top part is simply swung down over the bottom part with the end walls 20 and 21 and the side wall 25 being enclosed within the corresponding elements of the upper portion of the box.

In the formation of the blank the score lines are impressed in the corrugated material just deeply enough to crush the corrugations in the paper, and thus define the lines for folding the box, without going so deep as to completely break the fibers of the corrugated material along these lines. It is quite critical to the success of the box that the flaps comprising the sides and ends of the box retain a certain amount of springiness at the score lines so that the flaps tend to spring back toward the flattened condition shown in Figure 1. Inasmuch as the lines of corrugations extend from side wall 23 toward side wall 25, that is, across both the top and bottom panels, the tendency for the flaps to spring back toward the flattened condition is much greater in side wall flaps 23 and 25 than in end wall flaps 17, 18, 20 and 21. This is because score lines 22 and 24 extend across the corrugations in the box whereas score lines 15 and 16 extend with the lines of the corrugations. Thus, in the top portion of the box when the two end walls 17 and 18 are attached to the side wall 23 by the tape 32, the side wall 23 in tending to spring toward the flattened condition bows outwardly as shown in Figures 2 and 3. The bowing of side wall 23 results in a drawing in of end walls 17 and 18. As a result a force tending to spread end walls 17 and 18 is resisted by the tendency of wall 23 to spring outwardly. Or in other words, the two end walls 17 and 18 are held in the position shown in Figure 2, by the spring force of side wall 23.

Another critical factor which contributes greatly to the successful operation of the present box, is the fact that the score lines 15 and 16 are parallel to each other and each is straight, so that the top panel 10 is the same length as the bottom panel 11. If the box were made out of absolutely rigid material, such as heavy fiber or the like, it would be impossible under the circumstances to close the top portion of the carton down over the bottom portion. However, it will be noted that score lines 15 and 16 extend parallel with the lines of corrugation. When the score lines 15 and 16 are made, at least one of the flutes comprising the corrugations is crushed by each score line. As a result when the end walls are bent upwardly, the line of bending has some latitude beyond the actual score line. Thus, end walls 17 and 18 on the upper portion of the box can shift just slightly to the outside, and end walls 20 and 21 on the lower portion of the box can shift just slightly inwardly so that the end walls 20 and 21 on the bottom portion of the box can fit inside of end walls 17 and 18. The score lines 15 and 16 can be offset inwardly slightly in the bottom panel of the box from the lines in the upper portion of the box, if desired; but, it is suggested that the amount be not greater than two thicknesses of material at either side.

As stated above, the end walls have a certain tendency to spring outwardly from the folded condition toward the flattened condition, and thus a certain amount of friction exists between the respective upper and lower end walls which tends to hold the box closed. However, score lines 13 and 14, which define the upper and lower panels 10 and 11 respectively from the side wall 12, also have a certain amount of inherent springiness and it has been found that the friction developed between the re-

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spective end walls is insufficient to hold the box closed satisfactorily.

The actual locking of the box occurs as a result of the friction between the respective ends of side wall 25 and the joined corners of the upper portion of the box. This is shown in Figure 6. When end walls 20 and 21 of the lower portion of the box are bent inwardly the latitude of bending afforded by score lines 15 and 16 permits these walls to bend inwardly of the respective ends of side wall 25 so that the ends of walls 20 and 21, which are designated by the numerals 33 and 34 in Figure 1, are in fact overlapped by the respective ends of side wall 25 as shown at 35 in Figure 6. Thus, the two ends of side wall 25 are wedged between the respective ends 33 and 34 of flaps 20 and 21 and taped corners 31 of the upper portion of the box. Due to the springiness of side wall 23 and the fact that the two flaps 17 and 18 of the upper portion of the box are being pulled inwardly by the springiness of member 23, the respective ends 25 are in tight, locking frictional fit with the end walls 17 and 18. The frictional fit between the members is further augmented by the fact that the exposed ends of side wall 25 are rather rough, it being an inherent characteristic of corrugated paper that when it is cut either across grain or with the grain, a rather rough edge results. A further wedging action takes place as a result of the curvature of member 23, because it will be noted that when the exposed edge 36, see Figure 1, of side wall 25 rides up under curved member 23, edge 36 eventually, that is, when the box is completely closed, is adjacent and in line with the straight score line 22. Even though side wall 25 has a tendency to bow outwardly in the manner of side wall 23, it is impossible for it to do so once the box is completely closed. Thus, since side wall 25 is the same length as side wall 23, once edge 36 is seated against score line 22, the two exposed ends of member 25 are forced under a great deal of pressure into contact with the end walls 17 and 18. When side wall 25 is straightened out in this manner, it also tends to straighten out the curvature of side wall 23. Thus, in the closed box, side wall 23, even though it retains some curvature, is substantially straight and lies snugly beside side wall 25. As a result of the friction lock the two parts of the box are held very securely together so that once the box is filled with merchandise it is able to withstand a considerable amount of rough handling without coming open. It is recommended, however, that the two sections be sealed together with tape or other means for mailing purposes.

A second friction lock is incorporated in the box which may be utilized to hold the box partly open, in which position the box may be filled very handily. This position of the box is illustrated in Figure 3 and the details of the lock shown in Figure 4. Referring to these two figures, when the tabs 27—27 are bent inwardly from the respective end walls 17 and 18 to lie against the inside of side wall 12, the lower edges 37 of the tabs 27 engage with the ends 38 of side walls 20 and 21, the respective edges biting one into the other to retain the box in the partly opened condition. The box can be forced in either direction, that is, open or closed from this position, however, the locking force is sufficient to retain the upper portion of the box in the partly opened condition against its own weight and the spring forces at the score lines 13 and 14.

In the completely closed position, tab 27 along edge 37 rests on the inner face of lower panel 11 at score line 14, and due to the inherent stiffness of the material, it is practically impossible to pull outwardly the lower edge of end wall 17 or end wall 18 away from the respective end walls 20 and 21. This feature is quite important in that it insures that there are no loose tabs or exposed edges on the box which stick out to become caught during the handling of the box.

It will be noted that in the finished box the lines of corrugation extend up and down in the side walls 12, 75

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23, and 25. In this direction, the corrugated paper is most resistant to being crushed. Thus, the box is stressed along the two long edges which would be most likely to become damaged. Also, the upper and lower panels are trussed to a certain extent by reason of the lines of corrugation extending across the short width of the box.

In Figures 7—12 a modified method of securing the two corners of the upper section is disclosed. In this instance, the two end walls 17 and 18 of the upper section are provided with tabs 40—40 similar to the tabs 27—27 which are on side walls 20 and 21 of the lower section. In this instance, fastening is accomplished by means of a staple or clip indicated generally at 41, Figure 12. The staple includes a U-shaped body portion 42 having a tongue 43 extending upwardly therefrom. The body portion 42 includes two pairs of tangs which are indicated at 44 and 45 respectively. The tangs 44 are at the upper end of the U-shaped body 42 and are adapted to be bent over to embrace the edge of the side wall 23 adjacent the ends thereof. The other tangs 44 are adapted to pierce the wall 23 and be bent over at the inner surface in locking engagement with the corrugated material of the carton. This is best shown in Figure 8. At the upper end of the tongue 43, a series of tangs 46 are struck outwardly from the clip in the same direction as the tangs 44 and 45. Near the place where tongue 43 of the clip joins the U-shaped body 42, a pair of transverse slots are cut in the material of the clip in order to weaken the tongue, that is, make it more receptive to being bent at these two places. It is suggested that the clip be installed initially on the side wall of the carton by the manufacturer. These clips are available commercially and can be affixed by automatic devices.

When this clip is used to fasten the two corners of the upper section, the box may be shipped from the manufacturer to the ultimate user in the flat condition. Thus, the cartons can be stacked one on top of the other in order to conserve shipping costs. It is contemplated that the packager, that is, the one who is to fill the carton with merchandise, set the carton up. This is done by folding the end walls 17 and 18 upwardly, bending the tabs 40 inwardly onto the score line 22, and then folding the side wall 23 upwardly as shown in the step-by-step views, Figures 8 to 10 inclusive. Figure 11 shows the clip after it has been bent over on the two weakening slots 47 to embrace the tab 40. In this position, the tangs 46 on the tongue bite into the inner face of the tab 40 and the corner is locked securely against displacement.

At this stage, the modified carton is in the condition shown in Figure 2 of the drawings and is closed by folding upwardly the walls on the lower section and swinging the upper section over and down on the lower section to enclose the respective side walls. Locking occurs at the two corners of the upper section in the same manner that is described above in connection with the tape fastening. It will be noted that the tangs 44, 45 and 46 bite into the material of the cartons so that there is no chance for lateral shifting between the tabs and the side wall 23 when the two sections are joined. The result is that the parts are tensioned in the same manner as described previously.

The particular proportions of the box shown in the drawings are not critical, however, it is suggested that they be followed to a certain extent because if the box were made substantially deep, that is, if the depth of the side walls were increased substantially, it would be impossible for the upper section of the carton to fit down over the lower section. It is not suggested that the construction of the box disclosed here be utilized for all sizes and shapes of corrugated boxes, but only those which are substantially flat and follow the general proportions as to depth and width of the embodiment shown.

Having described my invention, I claim:

1. A mail order carton formed from a continuous sheet of corrugated paper material and comprising an upper section and a lower section, a common side wall joining said sections, each section including a rectangular panel having a pair of end walls and a second side wall, each of the panels being defined from their respective end walls and side walls by score lines impressed into the corrugated paper material sufficiently deeply to collapse the corrugations without breaking the fibers of the corrugated paper material, whereby the walls upon being bent at the score lines from the plane of the adjacent panel tend to spring back toward said plane, means fastening the end walls to the second side wall in the upper section at the two corners formed by bending the said walls inwardly on the score lines at substantially right angles to the upper section panel, the corresponding walls of the lower section being unfastened, and said panels and side walls being of substantially the same length so that upon closing the carton by enclosing the lower section within the upper section said sections are locked together by friction resulting from the tendency for the unfastened walls of the lower section to spring back toward the plane of the lower section panel.

2. A mail order carton formed from a continuous sheet of corrugated paper material and comprising an upper section and a lower section, a common side wall joining the sections, each section including a rectangular panel having end walls and a second side wall, each of the panels defined from their respective end walls and side walls by score lines impressed into the corrugated paper material sufficiently deeply to collapse the corrugations without breaking the fibers of the corrugated paper material, whereby the walls upon being bent at the score lines from the plane of the adjacent panel tend to spring back toward said plane, and adhesive coated tape fastening the end walls and second side wall of the upper section at the two corners formed by bending the respective walls inwardly on the score lines at substantially right angles to the top panel, the corresponding walls of the lower section being unfastened so that upon bending the walls of the lower section inwardly and enclosing the lower section within the upper section the said sections are locked together by friction resulting from the tendency of the unfastened walls of the lower section to spring back toward the plane of the lower section panel.

3. A mail order carton adapted to be supplied by the manufacturer in flattened condition and subsequent-

ly set up and made ready to receive goods for mailing, said carton formed from a continuous sheet of corrugated paper material and comprising an upper section and a lower section, a common side wall joining said sections, each section including a rectangular panel having end walls and a second side wall, both of the panels being defined from their respective end walls and their respective second side walls by score lines impressed into the corrugated paper material sufficiently deeply to collapse the corrugations without breaking the fibers of the corrugated paper material, whereby the walls upon being bent at the score lines from the plane of the adjacent panel tend to spring back toward said plane, and means for securing the respective end walls to the ends of the second side wall of the upper section only at the two corners formed upon bending the respective upper section walls inwardly on the score lines substantially at right angles to the upper section panel, said means including a pair of tabs, each tab of the pair formed as a continuation of an end wall of the upper section and being defined therefrom by a score line to permit said tab to be bent at substantially right angles to the end wall to lay adjacent the inner face of the inwardly bent second side wall, and a pair of deformable metal fasteners, each fastener initially secured to the outer face of the second side wall adjacent an end thereof and adapted to be deformed by hand at the time the carton is being set up to embrace the upper edge of said second side wall and the upper edge of the adjacent tab whereby the side wall and tab are secured together by said deformable fastener.

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