Nov. 15, 1927. 1,649,569

H. CARLE

BOX AND METHOD OF MAKING SAME

Original Filed Jan. 8, 1921 2 Sheets-Sheet 1

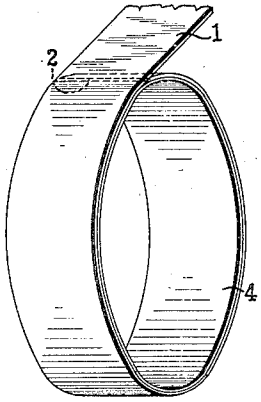

Fig. 1

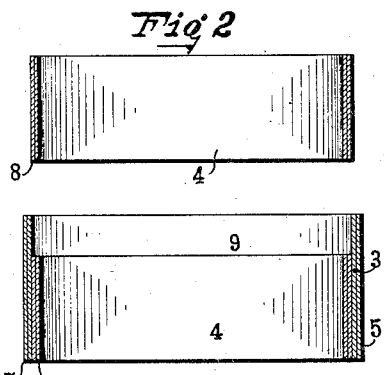

Fig. 2

Fig. 4

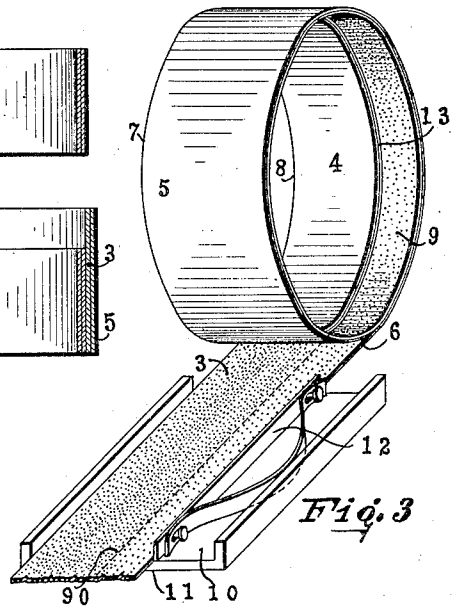

Fig. 3

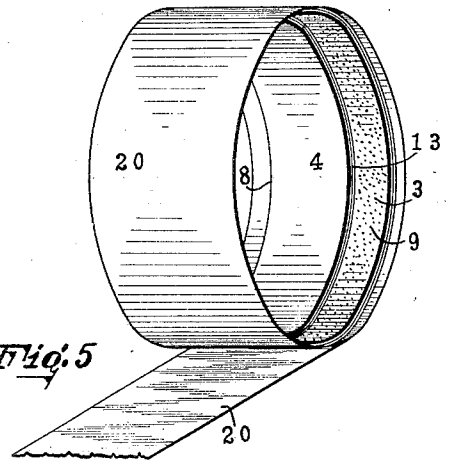

Fig. 5

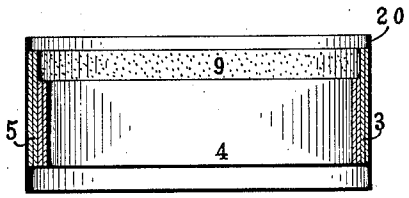

Fig. 6

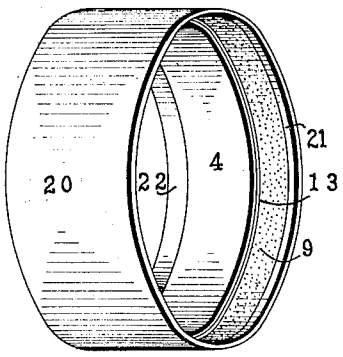

Fig. 7

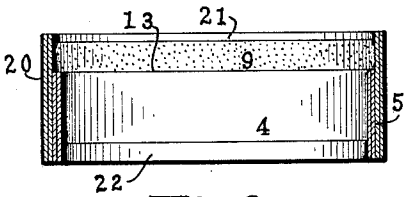

Fig. 8

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BOX AND METHOD OF MAKING SAME

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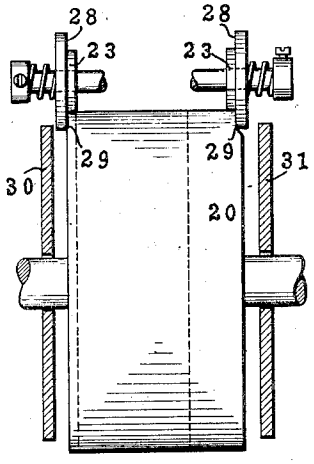
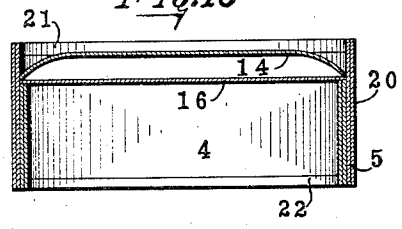


Fig. 9

Fig. 10



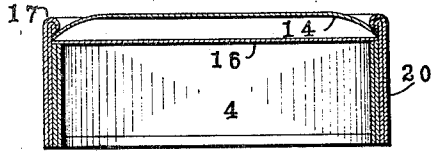


Fig. 11

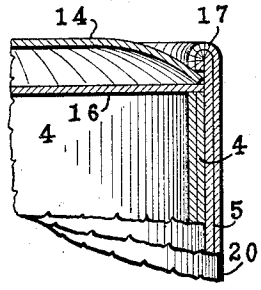


Fig. 14

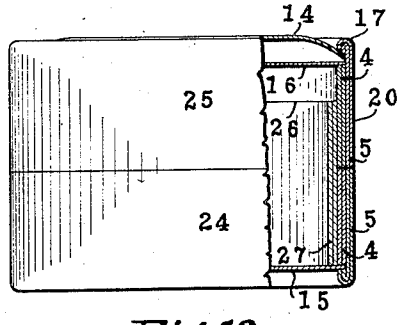


Fig. 12

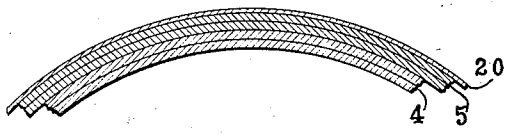


Fig. 13

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UNITED STATES PATENT OFFICE.

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BOX AND METHOD OF MAKING SAME.

Original application filed January 8, 1921, Serial No. 435,828. Divided and this application filed July 19, 1922, Serial No. 576,021. Renewed April 9, 1927.

This invention relates to boxes and the like nd especially to the construction of ornanental paper boxes and parts thereof.

A general object of the invention is to rovide a box having a crimped edge and vhich may be expeditiously made, and more specially that type of box in which the rimped edge is designed to retain the head f the box in place.

Another object of the invention is to proide a construction and arrangement of arts for paper rings which form a part, as he flange, of the type of box above referred o; which may be quickly and efficiently ade and which is specially adapted to unergo crimping and to take a smooth lasting rimp.

Another object is to provide an improved orm of strip from which the box elements ay be constructed.

Another object is the provision of a duable crimped edge which imparts a pleasing ppearance to the boxes.

Other objects will be in part obvious and part pointed out hereinafter.

This application is a division of applint's co-peding application, Serial No. 35,828 filed January 8, 1921, which deribes the method of making the box parts erein disclosed.

The invention accordingly consists in the eatures of construction, combinations of ements and arrangement of parts which ill be exemplified in the construction hereafter set forth, and the scope of their apication will appear in the appended claims.

In the accompanying drawings forming rt of this specification and wherein similar ference characters refer to similar parts roughout the several views,

Figure 1 is a perspective view illustrating coiled paper strip;

Fig. 2 is a sectional view through the ring rmed by coiling the paper strip of Fig. 1;

Fig. 3 is a perspective view illustrating a cond paper strip coiled around the ring Fig. 2. This figure also illustrates a guidg device for the second strip;

Fig. 4 illustrates a sectional view of the two rings formed by coiling the second strip around the first strip;

Fig. 5 illustrates the two rings of Figs. 3 and 4 encompassed by a third paper strip taken from a web of binding material;

Fig. 6 illustrates a sectional view through the rings of Fig. 5;

Fig. 7 illustrates the first, second, and third strips of Figs. 5 and 6 with the edges of the third strip folded around the opposite edges of the others;

Fig. 8 is a sectional view of Fig. 7;

Fig. 9 is an end elevation of the rings of Fig. 7 showing the spring-pressed squared roll which may be employed in folding the edge of the third strip on the second strip, a mandrel or form appearing in dotted lines;

Fig. 10 is a sectional view of Fig. 8 with the addition of a flat and domed head and before the crimping operation;

Fig. 11 is a view similar to Fig. 10 after the crimping has been effected;

Fig. 12 is a side elevation partly sectional of a box embodying the invention;

Fig. 13 is a longitudinal horizontal section through the rings on an enlarged scale; and

Fig. 14 is a sectional detail of the associated rings and heads adjacent the crimped part.

Referring now more specifically to the drawings, the numeral 1 indicates a strip of cheap short fibre paper as, for instance, exemplified in "card middle strip." This strip or web has one finished face and is coiled into a multiple-ply ring as, for instance, illustrated in Figs. 1 and 2, in which the strip is coiled twice and the coiled portion severed from the web as, for instance, along the dotted line 2. The finished surface of the strip is disposed to form the inner face of this ring, and the outer face of the strip is coated with adhesive to firmly attach the coils together. In the embodiment illustrated the rings are of circular outline. It is to be understood, however, that the ring may be oval or even angular in outline as, for instance, rectangular or hexagonal, without

departing from the spirit of the invention.

The numeral 3 indicates a strip of a tough fibrous grade of paper, as for instance, "craft paper" which has a long fibre and is not so apt to crack under the strain of crimping. The strip 3, as illustrated, is wider than the strip 1 and is coiled around the ring 4 formed of the strip 1 into a ring 5, the strip 3 being coiled twice around the ring 4, and the coiling being started at a point 6, preferably diametrically opposite the ends of the strip 1 in the ring 4, so that the joint of one ring does not lie at the same part of the circumferences as that of the other. One edge 7 of the craft paper strip is laid flush with an edge, as 8, of the ring 4 so that the multiple-ply or laminated ring 5 extends beyond the opposite end of the ring 4, as clearly illustrated at 9 in Figs. 3 and 4.

In the present embodiment of the invention, before the craft paper strip 3 is coiled around the ring 4, that face of the craft paper strip which is to be the inner face of the coils, is treated with sizing as, for instance, animal glue, which is permitted to become dry before the craft paper strip is utilized to form the coil. The full width of the craft paper strip is so treated, in the present embodiment, and just before the coiling thereof is effected that part of the width of the strip which registers with the first ring 4 is moistened to as to provide an adhesive face or coat which will stick to the outer face of the ring 4 when coiled thereabout, and so that the plies of the ring of craft paper will be secured to each other for a part of the width of the craft paper ring. That part of the width of the multiple-ply craft paper ring which extends beyond the end of the ring 4, as indicated at 9 in Fig. 3, will have the unmoistened and consequently dry sizing on its inner face and between the plies thereof. Thus the dry sizing has a non-adherent outer face between the plies of the extended portion 9 of the craft paper ring. In Fig. 3 the coat of sizing is indicated by the stippling, the dotted line 90 indicating the meeting line of the dry and moist sections.

The coiling of the strips 1 and 3 may be effected on a rotary cylindrical mandrel, or form, and the strips supplied to the mandrel by any suitable feed device. In the embodiment illustrated, however, the craft paper strip 3 is yieldingly pressed laterally as it is fed so that its edge, as 7, lies in predetermined relation to the edge 8 of the ring 4 on which it is coiled. As illustrated, the craft paper strip 3 lies in a guide channel 10 in a strip support 11. A spring-pressed guide plate 12 yieldingly presses against one edge of the strip 3 so that the opposite edge is pressed against the wall of the channel and thereby in line with the edge 8 of the rim 4.

Referring to Fig. 3, the inner edge 13 of the first multiple-ply ring forms a shoulder intercepting the wall of the second multiple-ply ring 5 or craft paper, and this shoulder provides a continuous support for a head, which may be a domed head, as illustrated at 14, Fig. 10, or a flat head as indicated at 15, Fig. 12. In the embodiment of the box illustrated a flat paper disk or additional head 16 is disposed on the shoulder 13 beneath the domed head 14, these parts being disposed to be held in place by the crimped portion of the ring, as will appear.

By the provision of the multiple-ply ring 5 with sizing between the plies, as described, an article is formed which lends itself readily to the crimping operation. The sizing on the extension to be crimped, is dry, so that the plies at this part are normally non-adherent. This sizing is then softened so as to be rendered adherent and thereupon the crimping operation is effected, the edges of the plies or laminæ of the ring 5 being folded inwardly or curled to form a bead, or crimp, 17, which will press down upon the head 14 and maintain it in position, all as indicated diagrammatically in Figs. 12 and 14. The softening of the sizing is effected, in the present embodiment, by heating the extended portion 9 of the multiple-ply ring of craft paper. This may be conveniently done by providing a heated crimping die and bringing the sized extended portion 9 of the ring 5 into contact with the die and letting it remain in contact therewith for a short time prior to effecting crimping. Thus the unmoistened sizing between the plies of the extended portion is softened and in condition to fasten together the plies of the extended portion of the ring 5 by causing them to adhere to each other. By the crimping operation the plies are turned inwardly and they readily, as it were, fold and slide upon each other, while the sizing is soft, so that the crimping operation is effective and neat. After the crimping operation the crimped parts are permitted to cool and this effects the hardening, or setting, of the sizing which thereby retains and holds the folded plies in crimped form.

Whereas the multiple-ply ring of craft paper with sizing between the plies, as described, lends itself readily to the crimping operation hereinbefore set forth, it is desirable in many instances to cover the craft paper ring with ornamental material and to bind the edges of the plies of craft paper together prior to and during the crimping operation. To this end a binding strip 20 (Fig. 5) is applied on the outside of the multiple-ply ring 5, the edges of this binding strip extending beyond each of the opposite edges of the craft paper ring. This binding strip may be of very thin material, thinner than the "card middle strip" or the craft

paper, and may be printed, coated or otherwise ornamented so as to give a desired ornamental surface to the ring 5. In the present embodiment the binding strip 20 is a gold strip, that is to say, one face has a golden appearance. Its opposite surface is given a thin coat of glue in order that it may adhere to the ring 5. The strip 20 having been coiled once around the ring 5 and cut off, the opposite ends of the resultant gold ring are folded across the multiple-ply edges of the assembled rings 4 and 5 and into and against the inner surface of said rings, as illustrated at 21 and 22, Fig. 7. In effecting the folding across the edge of the extension 9 of the multiple-ply ring 5, a roller 23, Fig. 9, is employed which is yieldingly pressed towards the edge of the ring during the folding operation and thereby makes the fold of the binding strip closely conform to the edge of this ring even though this edge be somewhat irregular. It is to be understood that the coiling of the strips 1, 3, and 20 into rings is effected by rotating the mandrel or form, and that the folding of the gold strip 20 at 21 is effected by the roller 23, as the mandrel rotates and as this strip is wound around the ring 5. Proper pressing rollers may be employed to assure that the coiling shall be smooth and tight. The provision of the folded thin binding strip 20 not only serves to ornament the outer face of the craft paper ring 5 but surrounds the dry-sized end of the craft paper ring and prevents access of extraneous matter as dust, atmospheric moisture, etc. to the sizing between the plies. The paper of which the binding strip 20 is composed, however, is thin and does not interfere with effective crimping. The adhesive for the binding strip is of relatively thin consistency and this and the thin binding paper 20 at the crimped edge merge with and form part of the crimp when the sizing is softened by heating the ring at its bound edge.

By the construction herewith described there is provided a crimped paper ring in which the crimp is "set" by the sizing, the sizing becoming hard and stiff and thereby setting the paper in crimped form. By the use of relatively thin paper coiled into ring form as explained, the ring may be made of any thickness desired and may be efficiently crimped.

In Fig. 12 of the drawing is illustrated a box in which the base 24 and the lid 25 are made in accordance with the method hereinbefore described. The box illustrated is designed to hold face powder and is provided on its interior with a cover 26 of imperforate frangible fabric, such as thin paper. The cover 26 at its edge is secured to an interior multiple-ply flange 27 which conforms to the shape of the inner wall of the base 24 and is adhesively secured to said inner wall. Likewise a portion of the flange 27 extends above the open end of the base and forms a neck with which the lid telescopes when mounted on the base. To obtain access to the powder in the box, the lid 25 is removed and the cover 26 broken, as by pressing a finger against it.

To fold the projecting edges of the binding strip 20 across the opposite edges of the multiple-ply rings, or body-ring fingers, as, for instance, rollers having square shoulders 28, are preferably employed. These rollers are illustrated at 23 in Fig. 9. It will be perceived that the respective projecting edges of strip 20, when folded across the adjacent edges of the multiple-ply ring, tend to and usually do gather or pucker on account of the decreased diameter assumed by the extreme edges of strip 20 when in ring form. On account of the gather or puckers in the folded edges of the binding-ring there is a tendency for the folded edges to "pop" or spring from the opposite edges of the multiple-ply ring. To avoid this possible separation, the edges of strip 20 are pressed closely against the opposite edges of the multiple-ply ring for the full thickness of the edges of the multiple-ply ring, the shoulders 28 of the rollers 23 being as deep or a little deeper than the thickness referred to. In this wise the folded edges lie in close contact with the edges of the multiple-ply, ring and the folded material, due to the puckers, takes up a position pointing inwardly of the multiple-ply ring, as indicated at 29, Fig. 9. In this wise, each folded edge of strip 20 maintains its folded condition close to the edges of the multiple-ply rings, so as to be readily folded into and pressed against the inner faces of the multiple-ply rings by subsequently operating folding elements, as the disk-folders 30 and 31 which move axially of the multiple-ply rings, into and out of opposite ends of the same, the perimeter of such disk-folders closely fitting he inner diameters of the multiple-ply ring at its respective opposite ends. It will be understood that after the edges of strip 20 are folded by the rollers 23 as the multiple-ply ring rotates with the mandrel, the disk folders 30 and 31 move axially, the perimeters thereof wiping the folds into the paper ring and against the inner wall thereof.

Preferably the disks 30 and 31 are so mounted as to rotate as the paper ring rotates, and the wiping of the folds into the paper ring occurs while the paper ring and said disk are rotating.

Thus by the above construction are accomplished among others the objects to which reference has hereinbefore been made.

As many changes could be made in the above construction and many apparently widely different embodiments of this invention could be made without departing from

the scope thereof, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

It is also to be understood that the language used in the following claims is intended to cover all of the generic and specific features of the invention herein described and all statements of the scope of the invention, which, as a matter of language, might, be said to fall therebetween.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A box part of the character described, including a multiple-ply ring with sizing between the plies, the sizing, for a part of the width of the ring, securing the plies together and, for another part of the width of the ring, presenting a non-adherent outer face.

2. A box part of the character described, including a multiple-ply ring with sizing between the plies, the sizing, for a part of the width of the ring, securing the plies together and, for another part of the width of the ring, presenting a non-adherent outer face, and a binder-strip surrounding that edge of the ring where said sizing is non-adherent.

3. A box part comprising a multiple-ply ring with sizing on the plies, the sizing, for a part of the width of the ring, securing the plies together, and for another part of the width of the ring presenting a non-adherent outer face, and a second narrower ring within the first said ring and secured thereto.

4. A box part comprising a multiple-ply ring with sizing on the plies, the sizing, for a part of the width of the ring, securing the plies together, and for another part of the width of the ring presenting a non-adherent outer face, and a second narrower ring within the first said ring and secured thereto, said second ring being adapted to support a head within the first said ring.

5. A box part comprising a multiple-ply ring with sizing on the plies, the sizing, for a part of the width of the ring, securing the plies together, and for another part of the width of the ring presenting a non-adherent outer face, a second narrower ring within the first said ring and secured thereto, and a binder-strip surrounding that edge of the first said ring where said sizing is non-adherent.

6. A box part comprising a multiple-ply ring with sizing on the plies, the sizing, for a part of the width of the ring, securing the plies together, and for another part of the width of the ring presenting a non-adherent outer face, a second narrower ring within the first said ring and secured thereto, said second ring being adapted to support a head within the first said ring, and a binder-strip surrounding that edge of the ring where said sizing is non-adherent.

7. A box part comprising a multiple-ply ring with sizing on the plies, the sizing, for a part of the width of the ring, securing the plies together, and for another part of the width of the ring presenting a non-adherent outer face, and a second narrower ring within the first said ring and secured thereto at the adherent width thereof.

8. A box part comprising a multiple-ply ring with sizing on the plies, the sizing, for a part of the width of the ring, securing the plies together, and for another part of the width of the ring presenting a non-adherent outer face, and a second narrower ring within the first said ring and secured thereto at the adherent width thereof, said second ring being adapted to support a head within the first said ring.

9. A box part comprising a multiple-ply ring with sizing on the plies, the sizing, for a part of the width of the ring, securing the plies together, and for another part for the width of the ring presenting a non-adherent outer face, a second narrower ring within the first said ring and secured thereto at the adherent width thereof, and a binder-strip surrounding that edge of the ring where said sizing is non-adherent.

10. A box part comprising a multiple-ply ring with sizing on the plies, the sizing, for a part of the width of the ring, securing the plies together and for another part of the width of the ring presenting a non-adherent outer face, a second narrower ring within the first said ring and secured thereto at the adherent width thereof, said second ring being adapted to support a head within the first said ring, and a binder strip surrounding that edge of the ring where said sizing is non-adherent.

11. A strip for forming box elements comprising a length of flexible material provided with sizing on one surface, said sizing being moistened for a portion of the width of said surface, and dry at another width of said surface.

12. A strip for forming box elements comprising a length of paper provided with sizing on one surface, said sizing being moistened for a portion of the width of said surface, and dry at the remaining width of said surface.

13. A strip for forming box elements comprising a length of paper of substantially uniform width and provided on one surface with sizing, said sizing being moistened for a portion of the width of said surface and dry for the remaining portion of such width.

14. A box part comprising a ring having a laminated wall, the laminæ being connected for a portion of the width of the ring and being disconnected at one edge of the part

over a portion of the width of the laminæ to permit the disconnected portions to move upon each other when crimped.

15. A box part comprising a ring having a laminated wall, the laminæ being disconnected at one edge of the part over a portion of the width of the laminæ to permit the laminæ to move upon each other when said edge of the box part is crimped, and a ring of less width secured within the part and stopping short of the disconnected portions of the laminæ.

In testimony whereof I affix my signature.

HAROLD CARLE.