J. WILCOX.

METHOD OF MAKING A CELLULOID ARTICLE.

APPLICATION FILED OCT. 16, 1916.

1,244,676.

Patented Oct. 30, 1917.

2 SHEETS—SHEET 1.

Fig. 1.

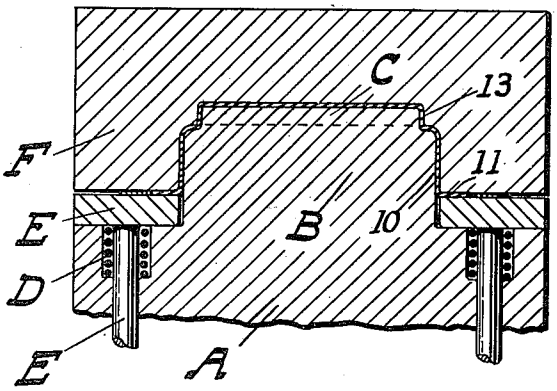


Fig. 2.

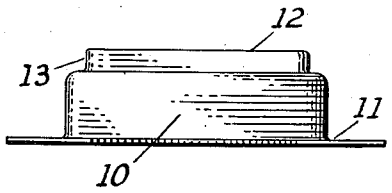


Fig. 3.

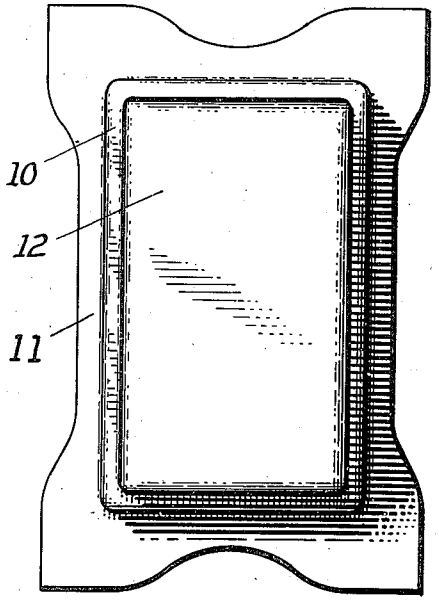
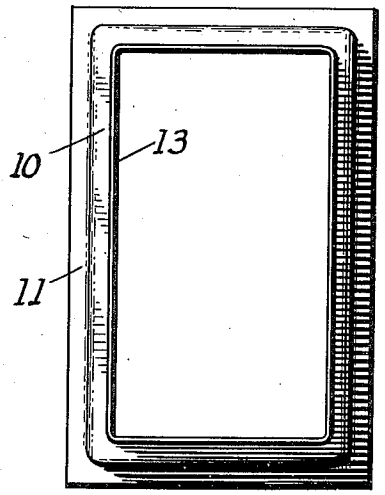


Fig. 4.



Inventor.

Joseph Wilcox.

By Attorneys.

Southgate & Southgate.

J. WILCOX.

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2 SHEETS—SHEET 2.

Fig. 5.

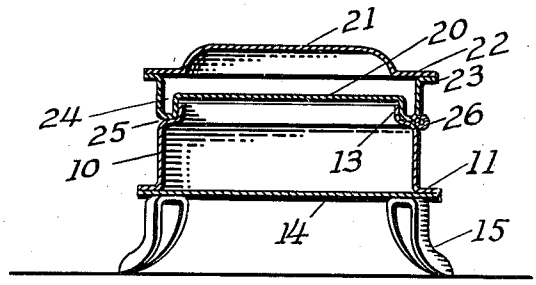


Fig. 7.

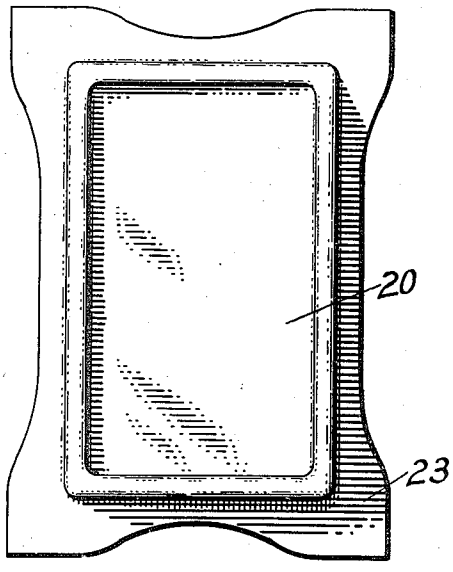
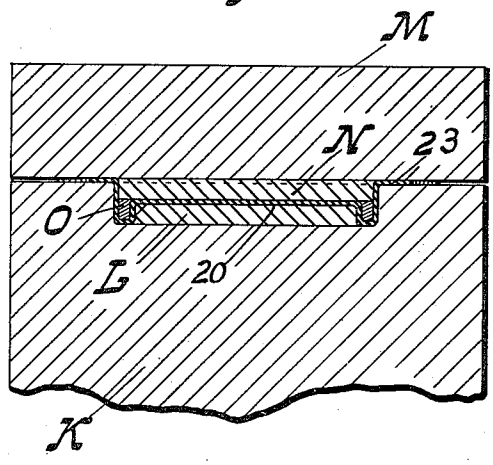


Fig. 6.



Inventor:
Joseph Wilcox.
By Attorneys.
Southgate & Southgate.

UNITED STATES PATENT OFFICE.

JOSEPH WILCOX, OF ATHOL, MASSACHUSETTS, ASSIGNOR TO JOSEPH WILCOX INC., OF ATHOL, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

METHOD OF MAKING A CELLULOID ARTICLE.

1,244,676. Specification of Letters Patent. Patented Oct. 30, 1917.

Application filed October 16, 1916. Serial No. 125,821.

To all whom it may concern:

Be it known that I, JOSEPH WILCOX, a citizen of the United States, residing at Athol, in the county of Worcester and State of Massachusetts, have invented a new and useful Method of Making Celluloid Articles, of which the following is a specification.

This invention relates to a celluloid article preferably in the form of a box, cover or receptacle, and the principal objects thereof are to provide an improved method of making it, whereby the manufacture is materially cheapened by reducing the number of steps required, and at the same time the appearance of the article is greatly enhanced, and yet it can be made of comparatively thin stock and with increased strength.

Further objects and advantages will appear hereinafter.

Reference is to be had to the accompanying drawings in which—

Figure 1 is a sectional view of a set of dies showing the first step in the production of the lower part of a jewel case or box in accordance with this invention;

Fig. 2 is an elevation of the blank as formed by this set of dies;

Fig. 3 is a plan of the same;

Fig. 4 is a plan of the blank after certain cutting operations have been performed thereon;

Fig. 5 is a transverse sectional view of a completed box and cover, the bottom of the same being formed from the blank shown in Figs. 1, 2, 3 and 4, the cover being formed in the manner shown in the remaining figures;

Fig. 6 is a sectional view of another set of dies with a blank therein showing the manufacture of the cover shown in Fig. 5, and

Fig. 7 is a plan of the blank taken out of the dies.

Celluloid boxes, jewel cases and the like have usually been formed by producing in dies a member with an upstanding rim around the same, and in order to provide an upwardly extending flange inside the rim a thinner body of sheet celluloid has been cemented to the inside of each wall thereof extending up above the same. The cover then fits down upon it. The cover is usually made of a single piece of celluloid, and consequently its undersurface is a duplicate of its upper surface, and it has to be made of thick heavy material in order that it may be strong enough for the purposes intended. This construction also involves difficulties in placing on the hinged sections because the two surfaces on which the hinges go are in the same plane and they have to be cut out to provide a place for the hinge. This necessitates another operation and additional expense. These difficulties and others are avoided by the method herein described, and a superior article is secured thereby as will appear.

The manufacture of the box itself will first be described. The main part of this is made from a single sheet of celluloid by means of the dies shown in Fig. 1 or some equivalent thereof. This set of dies consists of a block A provided with an upward projection B provided on the top thereof with a smaller section C spaced from the edge of the part B a uniform distance all around. The corner of the section B is rounded gently, preferably, for a purpose to be described. This block is provided with springs D and a stripping plate E having an opening therein enough larger than the block B to receive the celluloid of the desired thickness. It rests on the springs and is provided with guide posts E′ extending down from it through the springs. The springs normally hold this stripping plate up in such position that the flat sheet of celluloid can be placed upon it.

The female die block F is provided with a central opening therein of the same shape as the block B and of the same size and shape as the hole in the stripping plate. At its top it is recessed inwardly to force the sheet celluloid against the top surface of the parts B and C, and into the corners or recesses at their boundaries, there being sufficient clearance laterally and longitudinally to admit the sheet of celluloid of the desired thickness.

In the manufacture of the device the sheet of celluloid is placed on the stripping plate and over the top of the member C, and then the die F is placed upon it and forced down by pressure against the action of the springs until the sheet of the celluloid is properly compressed between the surfaces of the dies. This is done under the usual conditions of heat and the like pertaining in this industry.

Upon relieving the pressure the springs

bring all parts back up to the position in which the stripping plate is at substantially the level of the top surface of the member C which loosens the celluloid member 10 therein from the members B and C, leaving it supported on the stripping plate. The upper die member can then be removed and the blank taken out from the machine.

Figs. 2 and 3 show the blank removed from the press. It will be seen that this is a continuous member, there being no opening through it, but that the bottom is pressed outwardly. The next step in the method consists in trimming the irregular edges of the flat flange 11 of this blank down to a rectangular form. The top surface 12 of this blank is then cut off by cutting clear through the inner upwardly extending flange 13 so as to leave a top opening. This leaves the blank in the form shown in Fig. 4. Then another sheet 14 which eventually constitutes the bottom of the box is cemented to this flange all around the edge, and trimmed off to the shape indicated in Fig. 5. In this way the box portion is practically completed with the exception of cementing on the legs 15.

The cover is made in a somewhat similar way, but some of the previous steps are not required. In this case a die block K is shown provided with a recessed die surface having a central projection L which does not extend to the upper surface of the die block, and which is spaced from the surrounding walls, a space sufficient to receive the die section O, which will be described below, and two thicknesses of celluloid. The upper die member M is in the form of a block above the lower die block having a flat member N upon its face provided with a projecting die section or rim O around it which constitutes the die proper. We may say that these die blocks are preferably of wood and have a hard surface which may conveniently be made of vulcanized or indurated fiber, and that all the die members so far described are preferably constructed in that way, but these two members used for making the cover in this case are not entirely of this fiber, but the plate N and the plate L are of polished metal as for example brass, although I do not wish to limit myself to these materials.

The operation here is of the simplest die forming character, the flat sheet of celluloid being placed on the die member K and the die member M being forced down into it so as to provide the blank 20 shown in Figs. 6 and 7. This blank 20, however, constitutes only part of the cover, the lower part. The top of it 21 is made by any ordinary die-pressing operation such as has been in use heretofore, but care is taken that it shall be designed so as to provide a flat surrounding flange 22 which is cemented to the flange 23 of the member 20, and the same trimmed off so as to produce the cover shown in Fig. 5.

This cover, it will be observed, is of different shape inside from its outside shape, being formed of two members produced in different dies, and there being a material space inside and unseen between the top and the bottom surface. Furthermore, it is provided with a hollow downwardly extending portion 24 which extends all around it, and is designed to fit outside the upwardly extending flange 13 on the top of the box.

It is to be noted that with the construction shown the top of the box and the bottom of the cover have outside surrounding curved corners 25 registering with each other, producing a reëntrant angle, and this has an important advantage. In the first place it adds to the attractiveness of the device very materially on account of its gently curving lines and the fact that it is made of sheet material is not so obvious, but in addition to this, it provides a space in which the sections of the hinge 26 can be cemented without necessitating any cutting or shaping of these parts, and without projecting the hinge to an undesirable degree beyond the vertical surfaces of the parts which it connects. This is an advantage not only in the manufacture of the device but in the sale of it because it renders it more attractive.

The box and cover can be made of comparatively thin stock and yet have relatively great strength. Also the liability of the device to warp is greatly reduced by the shape of the top of the box and the double thickness of the cover.

I am aware of the fact that celluloid articles of various kinds have been made in dies of a simple character heretofore, and I do not claim such an article or such a method. Furthermore, I am aware of the fact that many modifications can be made in the articles herein shown and in the procedure by which the same are obtained without departing from the scope of the invention as expressed in the claims. Therefore I do not wish to be limited in these respects, but what I do claim is:—

1. A method of making a box which consists in shaping a blank of celluloid to provide it with continuous sides and ends, a flange at the bottom, and a flat top integral with said sides and ends all around, then cutting through said blank to remove the top and securing a sheet of celluloid to the bottom flange to constitute a bottom for the article.

2. The method of making a box which consists in shaping a flat sheet of celluloid to provide it with substantially vertical sides and ends, having a vertical continuous top rim, a flat continuous flange at the bottom projecting outwardly therefrom all

around, and a flat top integral with said rim all around, then cutting through said rim horizontally to remove the top and securing a plane bottom of sheet celluloid on said continuous bottom flange.

3. The method of making a box of sheet celluloid which consists in shaping a sheet so as to provide it with continuous sides and ends and an inwardly extending ledge at the top thereof forming a rim upstanding from the inner edges of said ledge and a top integral with said rim all around, then cutting through said rim horizontally throughout its length and width to remove said top, applying a bottom to the lower surface of said sides and ends, shaping another sheet of celluloid to provide a blank having a flat surrounding edge, a hollow surrounding projection extending down therefrom inside said edge, the inner vertical surface of said projection being adapted to fit frictionally outside said rim, and an inner portion below the plane of said edge and above the bottom of said projection, cementing a sheet to the top of said edge to form a cover and hinging said cover to the edge of said ledge.

4. The method of making a box of sheet celluloid which consists in shaping a sheet so as to provide it with substantially vertical sides and ends with a continuous flange at the bottom projecting outwardly therefrom and an inwardly extending ledge at the top connected with the sides and ends by a curved corner forming a rim upstanding from the inner edges of said ledge and a top integral with said rim all around, then cutting through said rim throughout its length and width to remove said top, applying a bottom to the lower surface of said bottom flange, shaping another sheet of celluloid in dies to provide a flat surrounding edge, a hollow projection extending down therefrom, the inner vertical surface of which is adapted to fit frictionally outside said rim, and a flat inner portion below said edge and above the bottom of said projection, cementing a pressed shaped sheet to the top of said edge to form a cover, trimming off the edge, and cementing one part of a hinge to the box and the other part to the cover.

In testimony whereof I have hereunto affixed my signature.

JOSEPH WILCOX.