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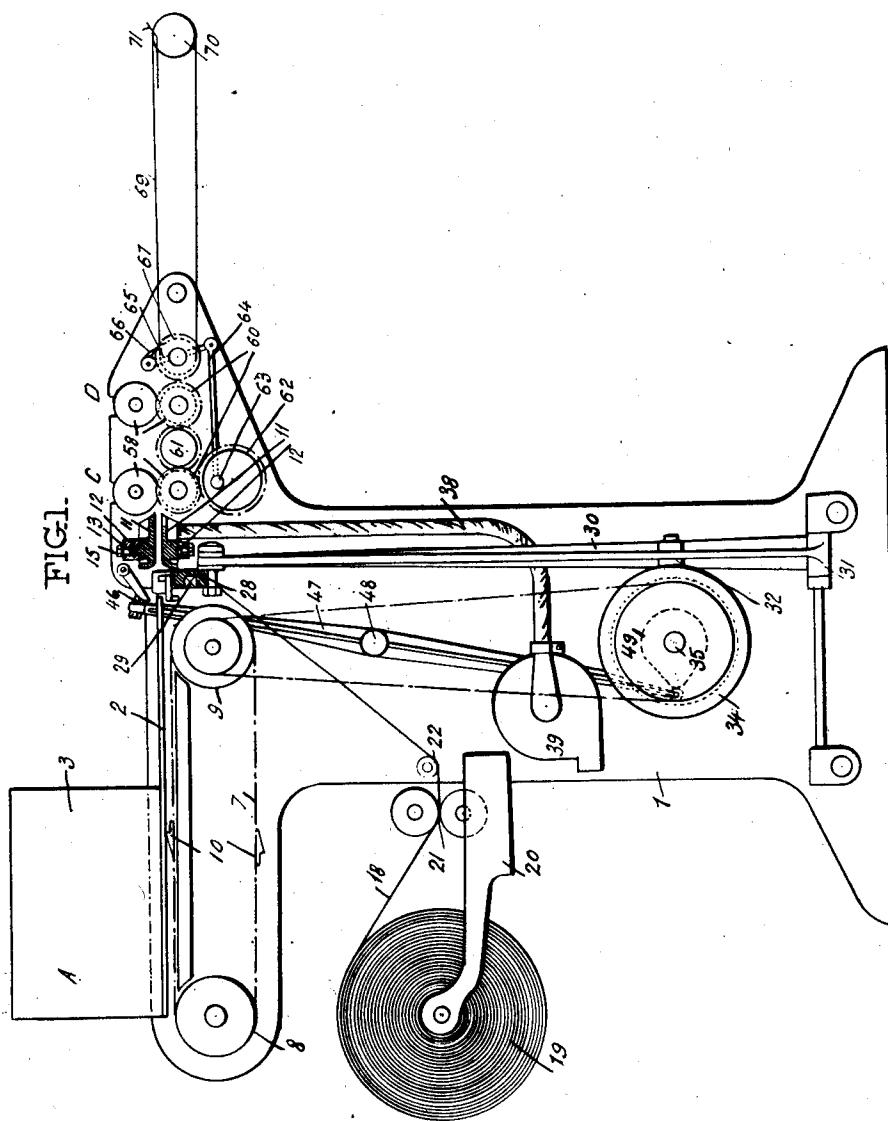
P. A. G. CASSEGRAIN

1,929,137

PROCESS AND APPARATUS FOR EDGING CARDBOARD ARTICLES AND SIMILAR OBJECTS

Filed Feb. 9, 1931

4 Sheets-Sheet 1



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Oct. 3, 1933.

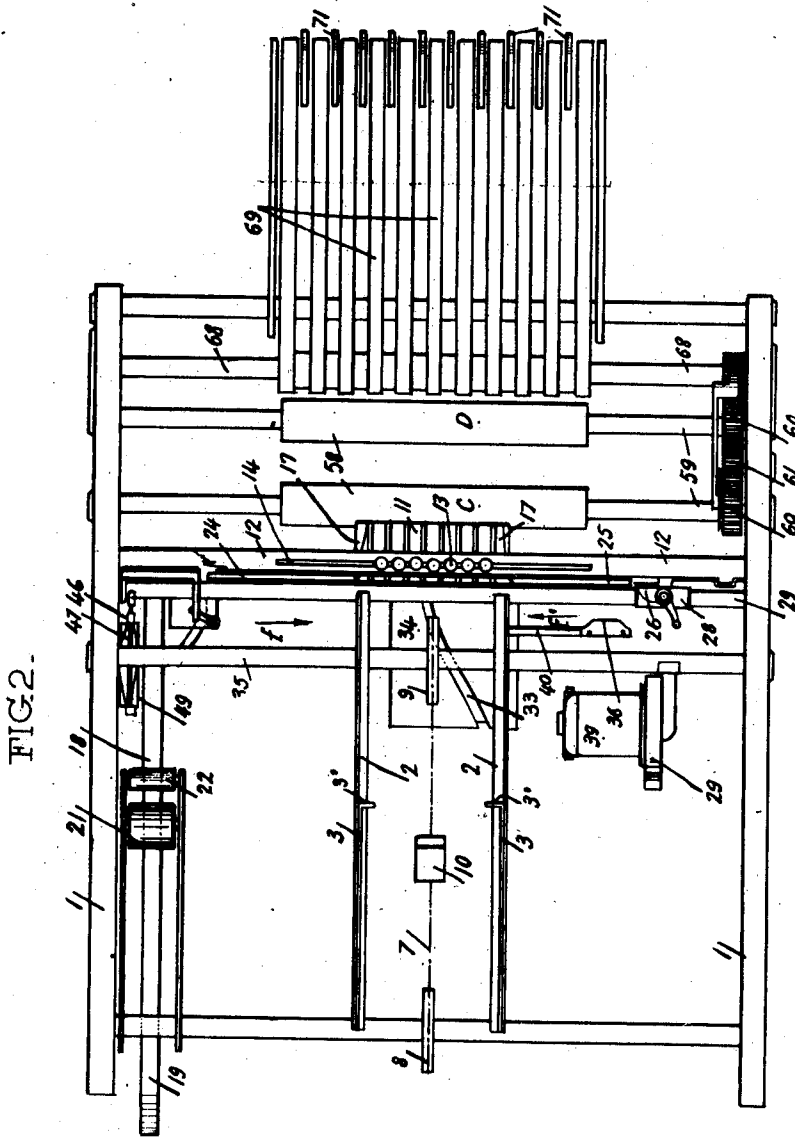
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PROCESS AND APPARATUS FOR MOLDING CARDBOARD ARTICLES AND SIMILAR OBJECTS

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4 Sheets-Sheet 2



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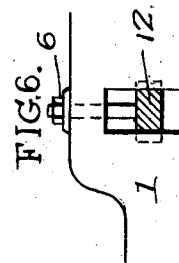
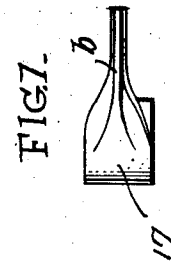
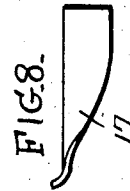
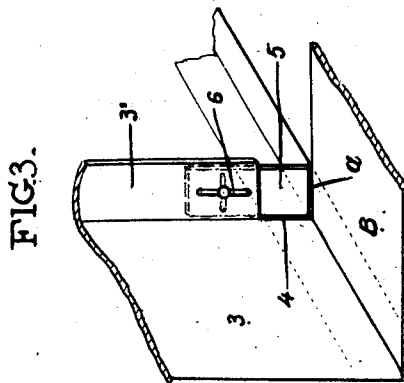
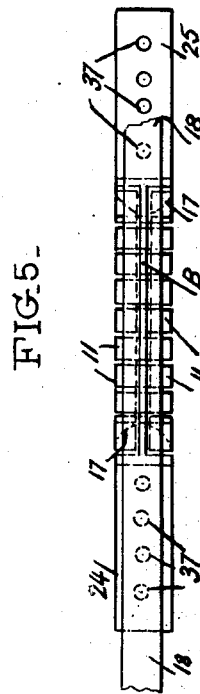
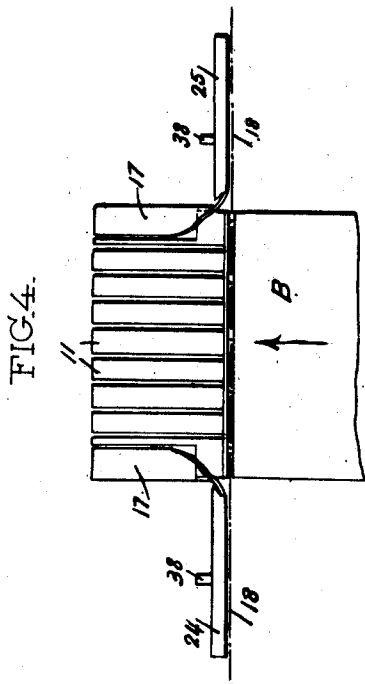
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PROCESS AND APPARATUS FOR EDGING CARDBOARD ARTICLES AND SIMILAR OBJECTS

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4 Sheets-Sheet 3



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PROCESS AND APPARATUS FOR EDGING CARDBOARD ARTICLES AND SIMILAR OBJECTS

Filed Feb. 9, 1931

4 Sheets-Sheet 4

FIG. 9.

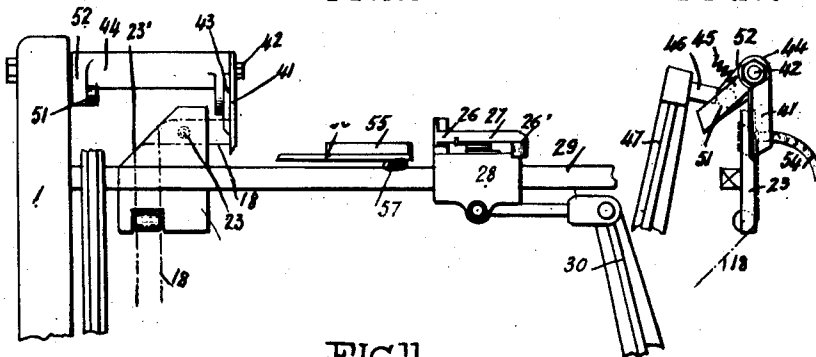


FIG. 10.

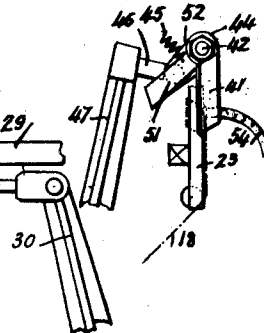


FIG. 11.

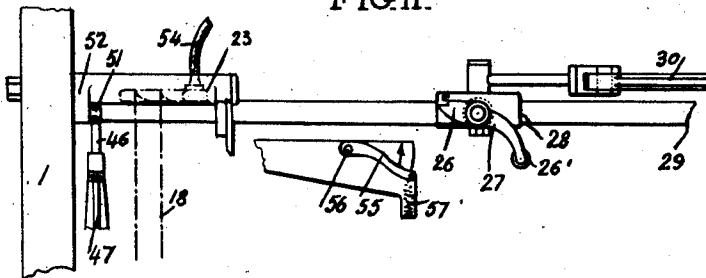
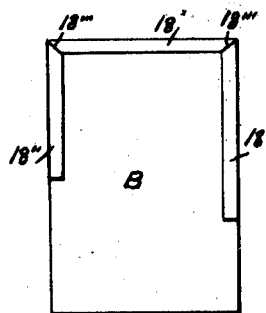


FIG. 12



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UNITED STATES PATENT OFFICE

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PROCESS AND APPARATUS FOR EDGING
CARDBOARD ARTICLES AND SIMILAR
OBJECTSPierre Auguste Gustave Cassegrain, Rennes,
FranceApplication February 9, 1931, Serial No. 514,690,
and in France February 12, 1930

9 Claims. (Cl. 93-1)

This invention relates to a process and an apparatus for edging or lining the edges of, sheets of cardboard, plates of glass or other material or similar objects, with a strip of paper, fabric or other material.

The process in question consists substantially in bringing the plate (or other article) to which a movement of advance has been imparted at right angles to the paper (or other) strip which it meets in the centre of its width (if the edging or lining is to be of the same width on both faces of the plate), then in introducing the plate or other article and the strip of paper which it is driving with it, between two fixed parts, in such a manner that the central portion of the paper should be automatically turned over on top and on the bottom of the plate, whilst its two free ends are applied to the lateral edges thereof and turned over above and below the said edges, the corner fittings being formed simultaneously at the two angles of the plate or other article.

As soon as the plate is thus lined on three of its sides, the lining is completed by causing it to pass in the other direction, with a new strip, between the two fixed parts.

For carrying out the process in practice may be utilized a machine comprising for instance one or more of the following characteristic features, either severally or in combination:

(a) The plates or other articles are stacked in a magazine or holder whence they are brought one after another to the edging device by an endless chain or band having a movement of advance and provided with driving fingers or tappets, each of which drives the bottom box of the stack out of the magazine;

(b) the edging device is constituted by bottom and top blocks. The distance between said blocks is adjustable in the horizontal plane and in height, these blocks being preferably chamfered or bevelled at their front edge so as to provide a suitably widened inlet for the boxes or other articles;

(c) the edging device is completed at each side by a part having the shape of half-a-funnel, the edges of which are turned gradually from the front backwards until they form a kind of gutter, to enable the edges of the paper or other strip to be applied to the sides of the plate and to be turned over above and below the said sides;

(d) the paper or other strip, previously gummed or pasted, is stretched in front of the edging device, then cut to the desired length and held in place in front of the said device at right angles to the direction of movement of the plate

or cardboard, by suction caused for instance by exhausting air from hollow parts provided with holes in front of which the strip is moved;

(e) the paper or other strip wound for instance on a bobbin, can be unwound, passed if desired over a device ensuring its being turned over at right angles to the direction of movement of the plate, then seized by pincers which stretch it in front of the edging device and automatically release it by opening as soon as the desired length of strip has been unwound, a suitable shearing or cutting device then cutting off automatically the desired length of strip;

(f) the strip thus cut to the desired length is held straight by suction due for instance to exhausting of air in the turning over device or elsewhere;

(g) the pincers are held by a sliding carriage so that they can seize the free end of the paper or other strip after the cutting off of the portion of the latter intended for one edging operation and the completion of the said operation, and can stretch it in front of the edging device for a new operation;

(h) the plate once having been edged or lined, passed between rollers preferably lined with rubber and intended to cause the edging to adhere to the box.

A construction according to the invention is illustrated by way of example in the accompanying drawings, without, however, any limitation.

In the said drawings:

Figure 1 shows the apparatus in cross-section through the edging device.

Figure 2 shows the apparatus in plan.

Figure 3 is a partial detail view of the magazine for the articles to be edged.

Figures 4 and 5 are detail views, in plan and in front elevation, of the edging device.

Figure 6 is a partial detail view of the means for regulating the height of the sliding bar for the upper edging blocks.

Figures 7 and 8 are detail views of one of the parts in the form of half-funnel of the edging device.

Figures 9, 10 and 11 are detail views of the mechanism for cutting off the paper or other strip and of the movable pincers for seizing it.

Figure 12 shows a plate after an edging operation in the apparatus.

On a bed or frame 1 (Figures 1 and 2) are mounted two angle irons 2 lined at the back and on a portion of their length with two vertical plates 3 turned at right angles at 3' towards the front so as to form a kind of magazine or holder

A in which can be stacked the plates or other articles B (Fig. 3) to be edged. At the bottom each of the right angle flanges 3' has a recess 4 (Figure 3) closed by a movable vertical blade 5 vertically adjustable by means of a screw 6 so as to enable the height of the free passage *a* left at the bottom by the said right angle flanges to be regulated so as to allow the plates B or other articles to be driven one after another out of the magazine towards the edging device; the height of the passage *a* will depend therefore on the thickness of the plate or other article.

The two angle irons 2 instead of being permanently secured to the bed of the machine, are preferably mounted at an adjustable distance from each other, so as to enable plates of any length to be edged.

Under the magazine A travels the upper section of an endless chain 7 which passes over guide wheels 8—9 and is provided at intervals with tappets 10 of the thickness of a plate or other article, each intended to drive one of the latter (the lowest of the stack) towards the edging device when it passes right under the magazine.

The edging device is constituted by two sets of blocks 11 (Figures 1, 4 and 5). Each block of a set is mounted so as to slide along a bar 12, at a suitable point of which it can be fixed by means of a bolt 13 passing through a slot 14 of the bar, and of a nut 15. It is thus possible to regulate at will the distance between the blocks 11 of each set and the width of the plates or other articles to be edged or lined.

The upper bar 12 can be arranged at the desired distance from the bottom bar 12 to suit the thickness of the articles to be lined or edged, owing to the fact that it is mounted in a vertically adjustable manner by means of the screws 16 in the bed 1 of the machine (Figure 6).

Each block 11 is preferably rounded-off in front so as to facilitate the penetration of the plate and of the strip of edging paper, without any possible deterioration, between the top and the bottom blocks.

At either side of the top and bottom blocks 11 are arranged sort of half tunnels 17 (Figures 4 and 5) each constituted by one or two parts (for instance of cast bronze) having a vertical surface curved at the side of the inlet for the plate or other article, the said surface being extended by a more or less pronounced folding of its upper and lower edges so as to form finally a real horizontal gutter *b* (Figures 7 and 8). Each of the parts 17 has therefore really the shape of half a funnel; the latter, cut in an axial plane, has its widened opening at the side of arrival of the boxes to be lined, the edge of which subsequently engages with the reduced portion or gutter of the half-funnel.

The position of each of the half-funnels 17 can also be adjusted at will along the bars 12 by means of nuts and bolts or screws, the same way as already described for the blocks 11.

The paper strip 18 intended for lining the plates or other articles is unwound from a bobbin 19 mounted on a bracket 20 secured to the bed 1. The strip passes afterwards into a gumming or pasting device 21 of any desired well known type, then over a guide pulley 22 and finally over a hollow block 23 (Figures 9—11) having one of its sides 23' cut at 45° and rounded-off, on which the strip is turned into vertical position in a plane at right angles to the plane of its previous travel.

The paper strip 18 passes then in vertical posi-

tion in front of the edging device previously described (blocks 11 and half-funnel 17) which is preceded and followed by two hollow bars 24 and 25, the object of which will be hereinafter described. The end of the paper strip 18 is then seized by pincers 26, the movable spring controlled branch of which is pivoted at 27 on a carriage 28 sliding along a bar 29 integral with the bed of the machine. It is on this bar 29 that can be fixed the block 23 described in the foregoing. A connecting rod 30 pivoted at 31 and provided with a roller 32 engaging with a cam groove 33 of suitable shape provided in the outside surface of a drum 34 driven by a shaft 35, makes it possible to reciprocate the carriage 28 along the bar 29.

Before starting the machine, a certain length of strip 18 is unwound by hand and caused to follow the path described up to the pincers 26 between the fixed and movable branch of which its free end is then fixed. The drum 34 is started, and on starting begins to move the carriage 28 in the direction of the arrow *f* of Figure 2, owing to which the strip of paper 18 is stretched in front of the edging device 11—17 and in front of the hollow bars 24, 25.

At a given moment the tail 26' of the spring controlled pincers 26 will meet a fixed cam surface 36 so that the pincers will be forced to open and to release the end of the paper strip 18. But the latter though released by the pincers remains in contact with the edging device 11—17 owing to the suction acting on it through the holes 37 provided in the hollow bars 24 and 25 connected by pipes 38 to a turbine or other suction apparatus 39.

The position of the cam surface 36 can be regulated at will along a bar 40 integral with the machine bed, to suit the length of lining strip 18 to be unwound.

At this moment the paper strip cutting device becomes operative and cuts it to the desired length. This device is constituted by shears (Figures 9—11) comprising a fixed blade 41 mounted at the end of a fixed spindle 42, and a movable blade 43 mounted at the end of a sleeve 44 rotating on the said spindle 42, and held normally open by a spring 45. A tappet 46 secured to the end of a rocking connecting rod 47 pivoted at 48 and operated by a cam 49 mounted on the spindle 35, presses against a roller 51 secured to an arm 52 provided at the other end of the sleeve 44.

The cutting device 41—43 becomes operative as soon as the end of the paper strip 18 has been released by the pincers 26, as already described. The end of the strip thus cut is then held in contact with the turning-over block 23 by the suction acting on it through the hole or holes 53 provided in the said block connected by a pipe 54 to the suction turbine or other apparatus 39.

The carriage 28 preferably makes a stop at the end of its travel in the direction of the arrow *f*, in order to enable a plate of a larger size which has got into the edging device 11—17, as will be seen later, to disappear completely before the return on the carriage begins. As soon as the plate is lined, the carriage 28 returns in the direction of the arrow *f*' of Figure 2; the tail 26' of the pincers 26 strikes then a cam surface pivoted at 56 which forces the said pincers to open. It is in this position that the pincers 26 reach the new free end of the paper strip 18 held in contact with the block 23 as already described. At this exact moment the cam surface 55 is passed 150

and the pincers 26 exposed to the action of their spring, close over the end of the paper strip. The carriage 28 resumes thereupon its movement in the direction of the arrow *f* and pulls the paper strip with it.

machine is in the other direction in order to complete its lining on all sides.

It will be seen that the apparatus makes it possible to edge or line plates or other articles of very different shapes, and the passage from one side to another is a very simple matter and can be done very quickly.

I claim:—

1. Process for edging plates with a strip, which consists in causing a plate, moved at right angles to the strip, to meet said strip at an intermediate point of its width, in introducing the plate together with the strip driven thereby between two fixed parts, in automatically folding over the central portion of the strip on top and bottom of the plate, in applying the free ends of the strip to the lateral edges of the plate and in producing simultaneously the corner fittings at the two angles of the plate.

2. In an apparatus for carrying out the process described, a magazine for holding plates, means for feeding the plates, means for holding a strip, cam-controlled means for leading said strip across the path of travel of the plate and coacting with the holding means for holding it under tension, means for severing the strip at the desired length, means for applying the strip on the sides of the plate and means for causing folding of the strip and for turning the free ends on top and bottom of the plate as said plate advances, said applying means and folding means coacting simultaneously to fold the strip over the two leading corners of the plate, means for pressing the stripped plate to cause adhesion of the strip, and means for discharging the finished product.

3. In an apparatus for carrying out the process described, a magazine for holding plates, means for feeding the plates, a bobbin supporting the coils of a strip, a gumming device for the strip, a guide pulley for the strip, a hollow block cut out at 45° on one side and rounded off, pincers for seizing the end of the strip, a sliding carriage supporting the movable spring controlled branch of said pincers, cam-controlled means for leading said strip across the path of travel of the plate and coacting with the holding means for holding it under tension, means for severing the strip at the desired length, means for applying the strip on the sides of the plate and means for causing folding of the strip and for turning the free ends on top and bottom of the plate as said plate advances, said applying means and folding means coacting simultaneously to fold the strip over the two leading corners of the plate, means for pressing the stripped plate to cause adhesion of the strip, means for discharging the finished product.

4. In an apparatus for carrying out the process described, a magazine for holding plates, means for feeding the plates, a bobbin supporting the coils of a strip, a gumming device for the strip, a guide pulley for the strip, a hollow block cut out at 45° on one side and rounded off, pincers for seizing the end of the strip, a sliding carriage supporting the movable spring controlled branch of said pincers, a fixed cam opening the pincers for leading the strip across the path of travel of the plate and coacting for holding it under tension, means for severing the strip at the desired length, means for applying the strip on the sides of the plate and means for causing folding of the strip and for turning the free end on top and bottom of the plate as said plate advances, said applying means and folding means coacting simultaneously to fold the strip over the two lead-

In this movement the tail of the pincers 26 strikes the cam surface 55 from behind and slides over the back of the said surface which, being pivoted at 56 and provided with a return spring 57, disappears for a moment so as to allow the closed pincers 26 to pass. The carriage 28 proceeds then on its travel as already described.

The edging or lining of plates or other articles takes place therefore as follows:

The paper strip cut in the manner described, held vertically by the action of the suction holes 37 in front of the edging device 11—17 with its gummed face facing the magazine A for plates or other articles a plate B for instance, brought by one of the tappets 10 of the endless chain 7, is pushed by the said tappet between the blocks 11. This plate meets then the paper strip 18 in the middle of its width and drives it with its front edge in penetrating into the space widened at its front part which separates the blocks 11. The paper strip 18 is therefore turned over (with its gummed face against the plate) at each side on the front edge of the plate B which is thus edged or lined at 18' (Figure 10).

At the same time the plate B gets gradually with its lateral edges into the gutters *b* of the funnels 17. The two free ends of the paper strip 18, driven in the movement of advance of the plate, are turned over the lateral edges of the latter by the said gutters *b* and cover them at the top and at the bottom at 18'' (Figure 12). During this turning over of the free ends of paper on the sides of the plate, the corner fittings 18''' are automatically formed in a perfect manner at the angles or corners of the plate.

On leaving the device 11—17 forming folds and edging or lining, the plate B passes between the top and bottom rollers 58 (of rubber, or preferably rubber coated on their circumference) of sets of rolls C, D which are intended to apply the edging paper 18 to the plate and to ensure its adhesion.

The bottom rollers 58 of the said rolls C and D are mounted on spindles 59 carrying toothed wheels 60 meshing with a toothed pinion 61. The rollers of the set C begin to rotate when the plate B is pushed between them by the tappet 10 of the chain 7, and by means of the wheels and pinion 60—61 rotate the rollers of the set D in the same direction. A toothed wheel 62 meshes with a toothed wheel 61 of the set C and has an eccentric trunnion pin 65 for a connecting rod 64 which operates a rocking lever 65 provided at one of its ends with a pawl 66 engaging with a ratchet wheel 67 mounted on a spindle 68. The latter is therefore given a slow intermittent rotation by the rotation of the set C and produces a similar movement of a band 69 constituted for instance by several parallel endless bands passing over guide pulleys 70.

Each time that a plate B is pushed between the edging blocks 11, then between the rollers of the first set C, there will take place therefore an advance of the band 69 which causes an advance of the previously edged or lined plate and so on. On reaching the end of the band 69, the lined plate passes to the inclined planes 71 which discharge it outwards.

The plate once lined on three sides only as indicated in Figure 12, is reintroduced into the

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ing corners of the plate, means for pressing the stripped plate to cause adhesion of the strip, means for discharging the finished product.

5. In an apparatus for carrying out the process described, a magazine for holding plates, means for feeding the plates, a bobbin supporting the coils of a strip, a gumming device for the strip, a guide pulley for the strip, a hollow block cut out at 45° on one side and rounded off, pincers for seizing the end of the strip, a sliding carriage supporting the movable spring controlled branch of said pincers, a fixed cam opening the pincers for leading the strip across the path of travel of the plate and coacting for holding it under tension, a fixed blade on a fixed spindle, a rotating blade on said spindle, means for applying the strip on the sides of the plate and means for causing folding of the strip and for turning the free end on top and bottom of the plate as said plate advances, said applying means and folding means coacting simultaneously to fold the strip over the two leading corners of the plate, means for pressing the stripped plate to cause adhesion of the strip, means for discharging the finished product.

6. In an apparatus for carrying out the process described, a magazine for holding plates, means for feeding the plates, a bobbin supporting the coils of a strip, a gumming device for the strip, a guide pulley for the strip, a hollow block cut out at 45° on one side and rounded off, pincers for seizing the end of the strip, a sliding carriage supporting the movable spring controlled branch of said pincers, a fixed cam opening the pincers for leading the strip across the path of the plate and coacting for holding it under tension, a fixed blade on a fixed spindle, a rotating blade on said spindle, bottom and top blocks adjustable in the horizontal plane and in height and means for causing folding of the strip and for turning the free end on top and bottom of the plate as said plate advances, said applying means and folding means coacting simultaneously to fold the strip over the two leading corners of the plate, means for pressing the stripped plate to cause adhesion of the strip, means for discharging the finished product.

7. In an apparatus for carrying out the process described, a magazine for holding plates, means for feeding the plates, a bobbin supporting the coils of a strip, a gumming device for the strip, a guide pulley for the strip, a hollow block cut out at 45° on one side and rounded off, pincers for seizing the end of the strip, a sliding carriage supporting the movable spring controlled branch of said pincers, a fixed cam opening the pincers for leading the strip across the path of the plate and coacting for holding it under tension, a fixed blade on a fixed spindle, a rotating blade on said spindle, bottom and top blocks adjustable in the horizontal plane and in height and chamfered at their front edge and

means for causing folding of the strip and for turning the free end on top and bottom of the plate as said plate advances, said applying means and folding means coacting simultaneously to fold the strip over the two leading corners of the plate, means for pressing the stripped plate to cause adhesion of the strip, means for discharging the finished product.

8. In an apparatus for carrying out the process described, a magazine for holding plates, means for feeding the plates, a bobbin supporting the coils of a strip, a gumming device for the strip, a guide pulley for the strip, a hollow block cut out at 45° on one side and rounded off, pincers for seizing the end of the strip, a sliding carriage supporting the movable spring controlled branch of said pincers, a fixed cam opening the pincers for leading the strip across the path of the plate and coacting for holding it under tension, a fixed blade on a fixed spindle, a rotating blade on said spindle, bottom and top blocks adjustable in the horizontal plane and in height and chamfered at their front edge and, at each of said blocks, a half funnel adjustable in position with a vertical surface curved at the side of the inlet, hollow bars preceding and following said half funnel, holes in said bars, a suction apparatus connected by pipes to each of said holes, said blocks, funnel, bars and suction apparatus coacting simultaneously to fold the strip over the two leading corners of the plate, means for pressing the stripped plate to cause adhesion of the strip, means for discharging the finished product.

9. In an apparatus for carrying out the process described, a magazine for holding plates, means for feeding the plates, a bobbin supporting the coils of a strip, a gumming device for the strip, a guide pulley for the strip, a hollow block cut out at 45° on one side and rounded off, pincers for seizing the end of the strip, a sliding carriage supporting the movable spring controlled branch of said pincers, a fixed cam opening the pincers for leading the strip across the path of the plate and coacting for holding it under tension, a fixed blade on a fixed spindle, a rotating blade on said spindle, bottom and top blocks adjustable in the horizontal plane and in height and chamfered at their front edge and, at each of said blocks, a half funnel adjustable in position with a vertical surface curved at the side of the inlet, hollow bars preceding and following said half funnel, holes in said bars, a suction apparatus connected by pipes to each of said holes, said blocks, funnel bars and suction apparatus coacting simultaneously to fold the strip over the two leading corners of the plate, a set of top and bottom rollers following the funnels, means for rotating said rollers, means for discharging the finished product.

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