Jan. 2, 1951 E. C. BURHANS 2,536,421

CARTON OPENER

Filed May 19, 1948 2 Sheets-Sheet 1

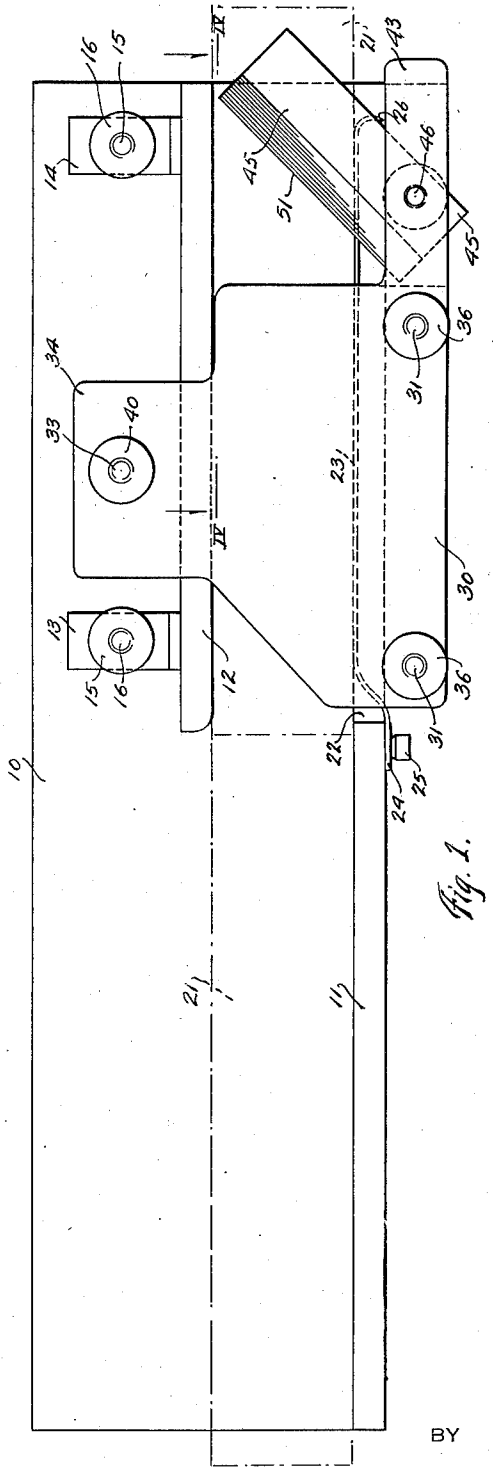


Fig. 1.

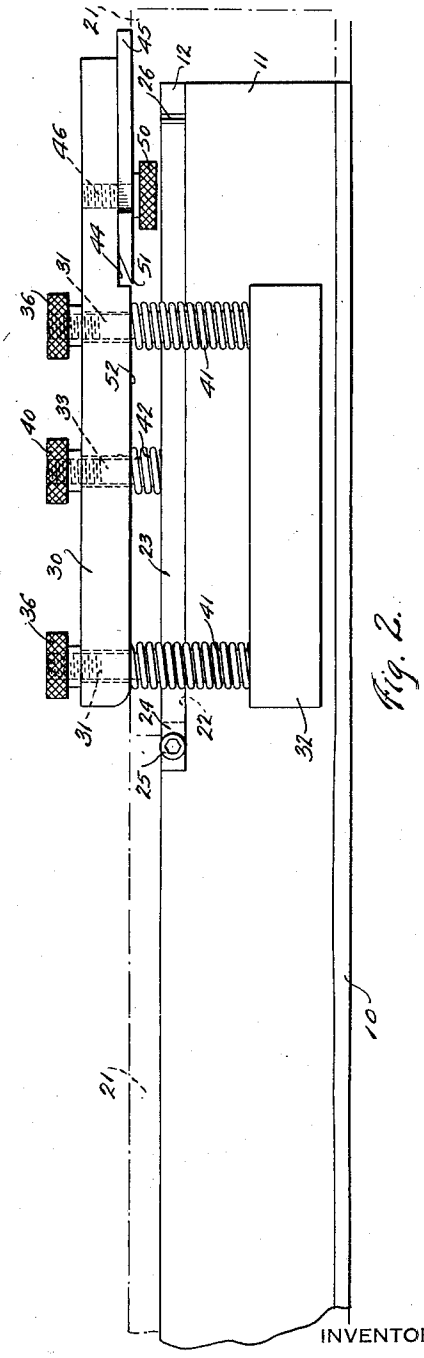


Fig. 2.

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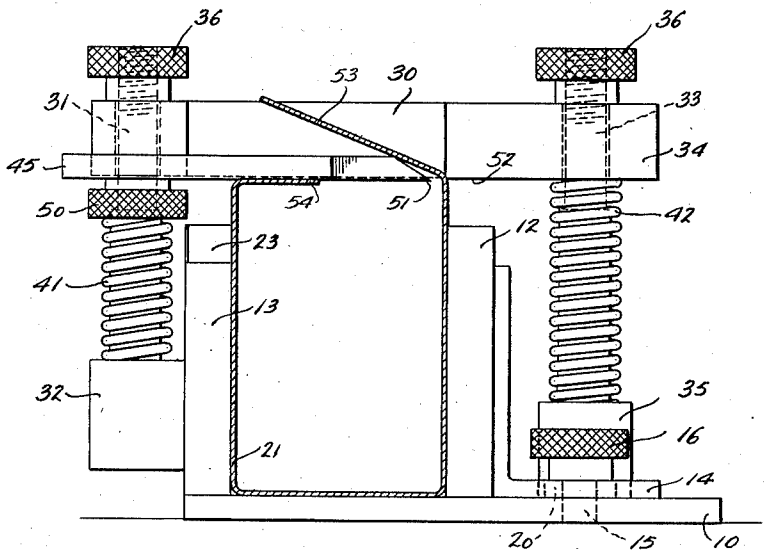


Fig. 3.

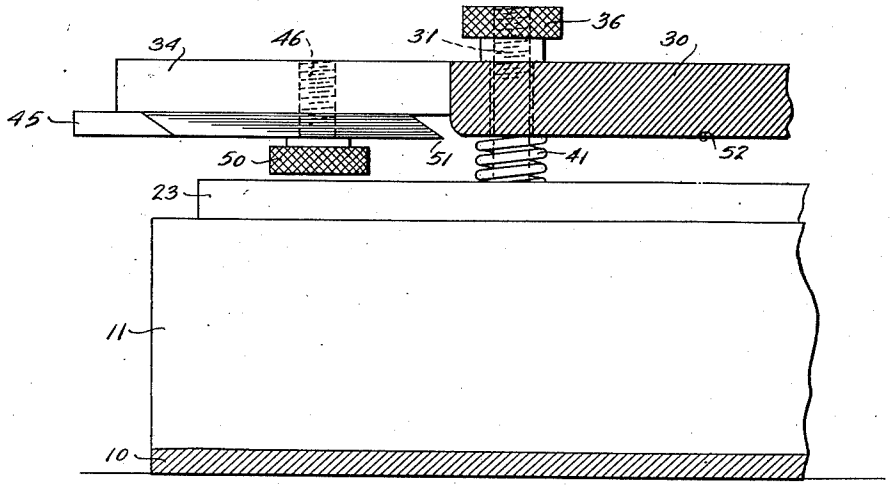


Fig. 4.

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CARTON OPENER

Eugene C. Burhans, Lockport, N. Y.

Application May 19, 1948, Serial No. 27,920

10 Claims. (Cl. 30—2)

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My invention relates in general to carton opener for opening the flaps along one side of a sealed carton to expose the contents thereof for inspection or for the application of a stamp, and relates especially to means for opening a carton of cigarette packages for the purpose of exposing the ends of the packages for receiving State tax stamps.

The principal object of my invention is to provide a device through which cartons may be fed by hand for the purpose of cutting through the end walls of the carton and breaking the adhesive which holds the flaps in position.

Another object is to provide a device in which the position and angle of the cutting blade may be accurately adjusted.

Another object is to provide a device which is safe to operate; one durable in construction; and one inexpensive to manufacture.

The above objects and advantages have been accomplished by the device shown in the accompanying drawings, of which:

Fig. 1 is a plan view of my device;

Fig. 2 is a side elevation thereof;

Fig. 3 is an enlarged end elevation of the device viewed from the discharge end thereof; and

Fig. 4 is an enlarged fragmentary sectional view taken on line IV—IV of Fig. 1.

While my device may be used in connection with cartons of any size or kind, in the accompanying drawings I have shown it as applied to cartons containing packages of cigarettes. Obviously, the device may be used alone as a cutter, and the severed cartons manipulated by hand, for the purpose of stamping, and resealing the flaps, or it may be used in connection with an automatic stamping and sealing machine, as shown and described in my now pending application Serial Number 782,807, filed October 29, 1947.

The device comprises a base 10 which extends preferably the full length thereof and along the front edge of which is arranged an outer guide wall 11. Extending rearwardly from a point substantially mid-way the length of the base is an inner guide wall 12. This guide wall is adjustable and is carried by two adjusting angles 13 and 14, one arranged preferably near each end of the wall and adjustably secured to the base by means of screws 15 provided with knurled heads 16 and each passing through a slot 20 formed in each of the angles.

As shown in Fig. 3 the inner wall 12 is adjusted in relation to the outer wall 13 to accommodate a carton 21 (shown in dot and dash lines in

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Figs. 1 and 2 and in full lines in Fig. 3) for free passage between the walls. The outer guide wall 11 is preferably reduced in height across that portion which is opposite the inner wall 12 thereby forming a recess 22 for the reception of a spring guide 23. This guide has its inner end 24 offset with relation to the body thereof and is extended across the recess to the outer face of the outer guide wall 11 where it is secured by a screw 25. The spring guide extends substantially the full length of the recess 22 and has its outer end 26 preferably curved in shape.

Mounted above the guide walls 11 and 12, is the cutter plate 30 of my device. This plate is mounted at its front edge upon two spring studs 31 which pass through suitable apertures formed in the plate and which are secured at their lower ends to an anchor block 32. The anchor block is preferably secured to the outer surface of the outer guide wall 11. Another spring stud 33 is arranged near the rear side of the cutter plate and passes through a suitable aperture formed in the rearward projection 34 thereof. The bottom end of this stud is secured to an anchor block 35 carried by the base 10 of the device. Each of the spring studs 31 have a knurled nut 36 carried on the upper end thereof, and the spring stud 33 has a knurled nut 40 carried by its upper end. Arranged about each of the spring studs 31 is a supporting spring 41, and arranged about the spring stud 33 is a supporting spring 42. The springs 41 have their lower ends bearing against the anchor block 32 and their upper ends against the under surface 52 of the cutter plate; and the spring 42 has its lower end supported by the anchor block 35 and its upper end bearing against the under surface of the rearward projection 34 of the plate.

The cutter plate is provided with a rearwardly extending arm 43, the under surface 44 thereof being recessed for the reception of the cutter blade 45 of the device. This cutter blade is secured in place within the recess by means of a screw 46 which passes through the cutter and into the arm and which is provided with a knurled head 50. As is clearly shown in the drawings, the cutting edge 51 of the blade is spaced a slight distance below the under surface 52 of the plate substantially equal to the thickness of the upper flap 53 of the carton (shown in Fig. 3) by which arrangement the cutter blade will be guided under the upper flap and between this flap and the lower flap 54, thereby serving to break the adhesive therebetween. Obviously, the cutter also passes through the end walls of

the carton during the process of separating the flaps. It is quite essential that the distance between the under surface 52 of the plate and the cutting edge 51 of the blade be accurately regulated, and also that the angle of the blade laterally of the line of carton travel be accurately adjusted. In order to accomplish this, the cutter plate 30 which is resiliently held and pressed upwardly by the supporting springs may be adjusted by turning the knurled nuts 36 and 40 carried by the studs 31 and 33 so that the cutting edge 51 of the blade will pass between the flaps as the carton is fed through the device. When it is necessary to sharpen or replace the knife blade, it is only necessary to remove the screw 46.

When the device is to be put into use, the carton 21 will be fed end to end into and through the device. The carton at the right of Fig. 1 is shown in position where its advance end wall has been severed and where the flaps 53 and 54 are being separated from each other. The first carton is being fed into and through the device by means of the second carton, whereby the operator is prevented from cutting himself by contact with the cutting edge of the blade. When the last carton is being fed through the device, it will have passed therethrough sufficiently to be safely grasped at the forward end by the operator and thereby withdrawn from the machine.

I claim:

1. A cutting device comprising a base, spaced guide walls rising from said base and forming a channel through which cartons having two sealed longitudinal flaps may be fed, a single cutting blade mounted over one of said walls and having its cutting edge extending across the channel with its free end positioned short of the other wall, and means for adjusting the vertical distance between said base and said blade, whereby the seal between said flaps will be broken and only the end walls will be severed at points adjacent the said flaps.

2. A cutting device comprising a base, spaced guide walls rising from said base and forming a channel through which cartons having two sealed longitudinal flaps may be fed, a cutter plate mounted above said walls and in spaced relation with the top surfaces thereof, a single cutter blade secured at one end to said plate over one of said walls and having its cutting edge extending across said channel with its opposite end positioned short of the inner surface of the outer wall, and means for vertically adjusting the horizontal plane of said cutting edge, whereby the seal between said flaps will be broken and only the end walls will be severed at points adjacent said flaps.

3. A cutting device comprising a base, spaced guide walls rising from said base and forming a channel through which cartons may be fed, a cutter plate mounted above said walls and in spaced relation with the top surfaces thereof, a single cutting blade secured at one end to said plate over one of said walls and having its cutting edge extending across said channel with its opposite end positioned short of the inner surface of the other wall, plate studs carried by said base for passage through apertures formed in said plate, a spring carried by each of said studs for supporting said plate, and adjusting nuts carried by said plate studs for tensioning said springs and for adjusting the height of said blade in relation to said base, whereby the seal between said flaps will be broken and only the end walls will be severed at points adjacent said flaps.

4. A cutting device comprising a base, an outer wall fixed to the base, an inner wall adjustably carried by the base and in spaced relation to the outer wall, a cutter plate disposed over the walls and in spaced relation to the base, said plate together with the walls and the base forming a channel through which cartons may be fed, spring means carried by the outer wall and the base for supporting the plate, and cutter means supported by the plate and extending over the channel between the walls and in spaced relation with the base.

5. A cutting device comprising a base, an outer wall fixed to the base, an inner wall adjustably carried by the base and in spaced relation to the outer wall, a cutter plate disposed over the walls and in spaced relation to the base, said plate together with the walls and the base forming a channel through which cartons may be fed, an anchor block supported by the base, studs carried by the block and the base, a cutter plate arranged above the walls and formed with apertures registering with the studs, supporting springs carried by the studs and engaging the bottom surface of the plate, an adjusting nut carried by the upper end of each of the studs and engaging the upper surface of the plate, and a cutter blade carried by the plate and extending over the walls.

6. A cutting device comprising a base, an outer wall fixed to the base, an inner wall adjustably carried by the base and in spaced relation to the outer wall, a cutter plate disposed over the walls and in spaced relation to the base, said plate together with the walls and the base forming a channel through which cartons may be fed, a cutter plate mounted above the walls and in spaced relation with the plate, means for adjustably supporting the plate, said plate having a rearwardly extending arm formed with a recess, and a cutter blade carried by the arm and mounted within the recess thereof, the relative thickness of the blade and depth of the recess being such as to position the cutting edge of the blade a predetermined distance below the lower surface of the plate.

7. A cutting device comprising a base, an outer wall fixed to the base, an inner wall adjustably carried by the base and in spaced relation to the outer wall, a cutter plate disposed over the walls and in spaced relation to the base, said plate together with the walls and the base forming a channel through which cartons may be fed, an anchor block supported by the base, studs carried by the block and the base, a cutter plate arranged above the walls and formed with apertures registering with the studs, supporting springs carried by the studs and engaging the bottom surface of the plate, an adjusting nut carried by the upper end of each of the studs and engaging the upper surface of the plate, said plate having a rearwardly extending arm formed with a recess, and a cutter blade carried by the arm and mounted within the recess thereof, the relative thickness of the blade and depth of the recess being such as to position the cutting edge of the blade a predetermined distance below the lower surface of the plate.

8. A cutting device comprising a base, spaced guide walls rising from said base and forming a channel through which cartons having two sealed longitudinal flaps may be fed, a cutter plate mounted above the walls and in spaced relation with the top surfaces thereof, a stud carried by

said plate adjacent one of said walls, a single cutter blade carried by said plate and extending toward the other of said walls, said blade having an aperture in one of its ends for mounting upon said stud and permitting angular adjustment of said blade upon said plate in a horizontal plane, and means for clamping said blade to said plate in its adjusted position, the outer end of the cutting edge of said blade being spaced from the inner surface of said other wall, whereby the seal between said flaps will be broken and only the end walls will be severed at points adjacent said flaps.

9. A cutting device comprising a base, spaced guide walls rising from said base and forming a channel through which cartons having two sealed longitudinal flaps may be fed, a cutter plate mounted above the walls and in spaced relation with the top surfaces thereof, a stud carried by said plate adjacent one of said walls, a single cutter blade carried by said plate and extending toward the other of said walls, said blade having an aperture in one of its ends for mounting upon said stud and permitting angular adjustment of said blade upon said plate in a horizontal plane, means for clamping said blade to said plate in its adjusted position, the outer end of the cutting edge of said blade being spaced from the inner surface of said other wall, and means for adjusting said blade vertically, whereby the seal between said flaps will be broken and only the end walls will be severed at points adjacent said flaps.

10. A cutting device comprising a base, spaced guide walls rising from said base and forming a channel through which cartons having two sealed longitudinal flaps may be fed, a cutter plate

mounted above the walls and in spaced relation with the top surfaces thereof, a stud carried by said plate adjacent one of said walls, a single cutter blade carried by said plate and extending toward the other of said walls, said blade having an aperture in one of its ends for mounting upon said stud and permitting angular adjustment of said blade upon said plate in a horizontal plane, means for clamping said blade to said plate in its adjusted position, the outer end of the cutting edge of said blade being spaced from the inner surface of said other wall, plate studs carried by said base for passage through apertures formed in said plate, a spring carried by each of said studs for supporting said plate, and adjusting nuts carried by said plate studs for tensioning said springs and for adjusting the height of said blade in relation to said base, whereby the seal between said flaps will be broken and only the end walls will be severed at points adjacent said flaps.

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