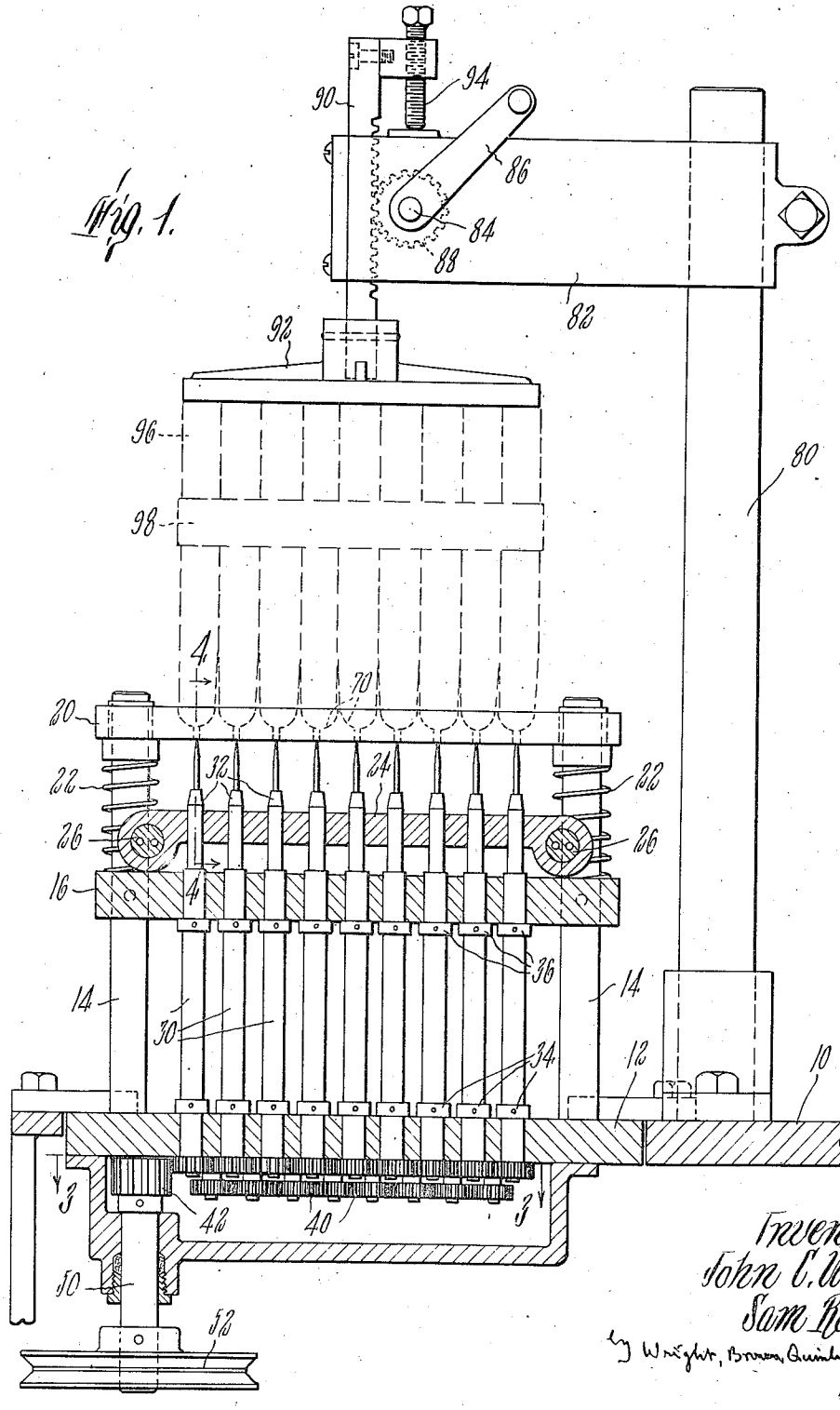
July 6, 1943. J. C. WARD ET AL 2,323,694

APPARATUS FOR PERFORATING CIGARS

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Fig. 1.




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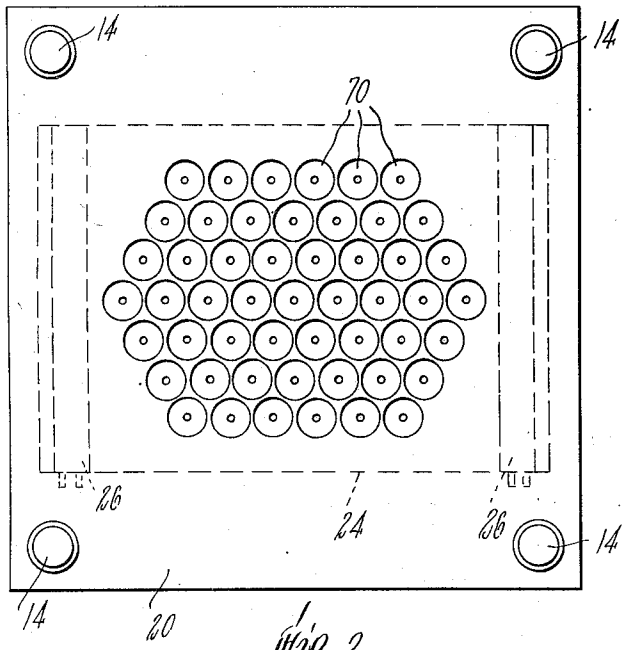



Fig. 2.

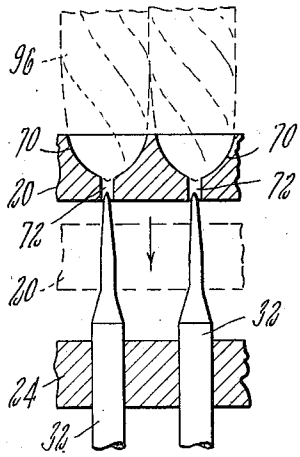



Fig. 4.

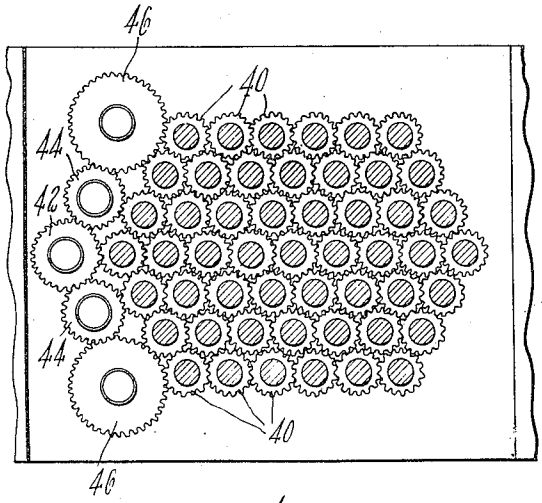



Fig. 3.

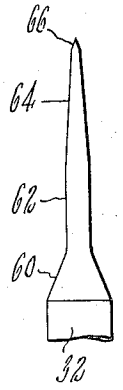



Fig. 5.

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# UNITED STATES PATENT OFFICE

2,323,694

## APPARATUS FOR PERFORATING CIGARS

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Application September 26, 1941, Serial No. 412,450

7 Claims. (Cl. 131—254)

This application is a continuation-in-part of our co-pending application Serial No. 376,864, filed January 31, 1941. The invention relates to apparatus for perforating cigars in bunches.

It is an object of the invention to enable an operator to perforate all of the cigars in a bunch of fifty at one time and to perforate them in such a manner as to reduce to a minimum damage of cigars during the perforating operation.

In order to enable a cigar to draw properly when smoked, it is desirable to provide a perforation in the head of the cigar extending inward along the axis for a substantial distance. This is done by inserting in the end of the cigar a heated needle, the needle being revolved during such insertion so as to make a smooth hole, the object of the heat being to dehydrate the tobacco adjacent to the needle so that the hole will not close when the needle is retracted.

According to the present invention, a cup plate is provided with recesses formed therein to receive simultaneously the heads of all of the cigars in the standard bunch as they come from the rolling machine operator. Coaxial with each cup is a perforation through the plate to receive the needles which extend through the plate to pierce the cigars which are pressed into the cups. The needles are continuously rotated and heated so that the perforating operation is properly performed, the cups being shaped to support the heads of the cigars so as to prevent cracking or damage to the cigars when the needles enter.

For a more complete understanding of the invention, reference may be had to the following description thereof, and to the drawings of which

Figure 1 is an elevational view, partly in section, of the apparatus embodying the invention.

Figure 2 is a plan view of the cup plate shown in Figure 1.

Figure 3 is a section view on the line 3—3 of Figure 1.

Figure 4 is a sectional view on the line 4—4 of Figure 1, but on a larger scale.

Figure 5 is a fragmentary elevation of one of the needles shown on a magnified scale.

The apparatus illustrated in Figure 1 includes a horizontal supporting table 10 to which is secured a bearing plate 12. Rising from the plate 12 are four posts or standards 14 on which is fixed an upper bearing plate 16. Above the upper bearing plate 16 is a cup plate 20 which is vertically slidable on the posts 14. The cup plate 20 is yieldingly supported above the plate 16 by suitable compression springs 22 which surround the posts 14. Resting on the plate 16 is a heater plate 24 which is provided with a pair of electric heating units 26. The bearing plates 12 and 16 are perforated to receive the shafts 30 of a set of perforating needles 32 which extend vertically through the heater plate 24. The needles are held against vertical movement by any suitable means such as collars 34 bearing on the upper face of the plate 12 and collars 36 bearing on the lower face of the plate 16. Below the plate 12 is mounted a geared mechanism for simultaneously rotating all of the needles 32. As indicated in Figure 3, the needles are arranged in rows corresponding in number and position to the rows of cups in the cup plate hereinafter described. On each needle shaft is fixed a pinion 40, the pinions in any of the rows being in mesh with one another from one end of the row to the other. Since the rows are so close together that clashing between the pinions of adjacent rows would result if the pinions in all of the rows were in the same plane, the pinions of alternating rows are at different levels, alternating between a higher and a lower level as indicated in Figure 1. The pinions in the several rows are driven by a suitable gear train indicated in Figure 3, this train as shown comprising a central drive gear 42 which meshes with the middle row of pinions and also with a pair of pinions 44, the latter being meshed with the end pinions of the two rows adjacent to the middle row. The pinions 44 engage the outer drive gears 46 each of which is in mesh with two rows of pinions 40. Thus all of the pinions 40 are simultaneously rotated from the drive gear 42, the direction of rotation of the individual needles being immaterial. The drive gear 42 is mounted on a drive shaft 50 which is connected to a suitable source of power such as an electric motor (not shown) by any suitable driving means such as a belt (not shown) on a pulley wheel 52 mounted on the shaft 50.

The shape of the needles 32 is more particularly illustrated in Figure 5. As therein shown, the needle has a cylindrical shank which tapers sharply at 60 from a diameter of ¼ inch to a cylindrical portion 62 of reduced diameter of ⅛ inch. This reduced cylindrical portion 62 is about $\frac{5}{16}$ inch in length and merges into a gradually tapering portion 64 which is about ½ inch in length and which terminates in a more sharply tapering point or tip 66. The shanks of the needles fit closely but slidably in the heater plate 24 so as to be effectively heated thereby.

The cup plate 20 is provided with a sufficient number of cups or recesses 70 to receive the heads

of all of the cigars in a standard bunch as it is made up by the operator of a cigar rolling machine. Such bunches are hexagonal in shape with the cigars arranged in rows of different numbers, the cigars of each row being staggered with respect to the cigars in adjacent rows, the arrangement being similar to the arrangement of cups 70 in the plate 20 as indicated in Figure 2. The cups 70 have a maximum diameter of 5/8 inch and a distance between centers of 3/4 inch. The depth of each cup is 5/16 inch and each cup has a perforation 72 coaxial therewith extending through the plate to receive a needle 32. These perforations are approximately 1/8 inch in diameter or just large enough to accommodate the cylindrical portion 62 of a needle. It is to be understood that these diameters of the cup plate and needles are given by way of illustration and not limitation, the actual dimensions being variable as desired.

As indicated in Figure 4, the cups 70 have rounded shapes which are approximately parabolic so as to be fitted by the head of the average cigar inserted therein. Thus the entire surface of the cigar head is supported, if the cigar is properly shaped, so that the outward pressure caused by the piercing action of the needle when it enters the head of the cigar is taken by the wall of the recess and splitting or cracking of the cigar head is thus avoided. If the cigar head is not properly shaped, the cup tends to shape the head when it is pressed therein.

Mounted on the supporting table 10 is a standard 80 to which is adjustably secured a bracket 82. This bracket carries a shaft 84 on which is mounted an operating crank 86 and a pinion 88. The pinion 88 meshes with a vertical rack 90 to the bottom end of which is secured a press plate 92. The rack 90 carries an adjustable stop element 94 which limits the downward movement of the rack.

During the operation of the apparatus hereinbefore described the needles 32 are continuously heated and rotated. The operator raises the press plate 92 sufficiently to permit the insertion of a bunch 96 of cigars, held together by the usual tape or band 98, onto the cup plate 20 so that the cigars are vertical and the heads of the individual cigars are seated in the cups 70. The crank 86 is then operated to move the plate 92 down against the bunch of cigars so that they push the cup plate down against the pressure of the springs 22. As the needles 32 are held against axial movement by the collars 34, the points of the needles enter the perforations 72 in the plate 20 and pierce the heads of the cigars seated in the cups 70. As the needles enter the heads of the cigars, the sharp tips 66 puncture the heads and these punctures are gradually widened by the tapered portion 64 until the perforations in the heads of the cigars reach the maximum diameter of 1/8 inch. The cigar bunch and the cup plate 20 are held in their depressed position as regulated by the stop element 94 for a period of two or three seconds or so according to the condition of the cigars. During this period the heated needles burnish and set the tobacco immediately adjacent thereto, so that when the cigars are withdrawn the holes do not close. At the proper moment the operator operates the crank 86 to raise the press plate 92. During the first portion of the upward movement of the press plate, the cigar bunch 96 follows it as the springs 22 restore the cup plate 20 to its elevated position shown in Figure 1. Further elevation of the plate 92 clears the bunch for removal from the cup plate, whereupon another bunch may be inserted for treatment.

It is evident that various modifications and changes may be made in the apparatus herein shown and described without departing from the spirit or scope of the invention as defined in the following claims.

We claim:

1. Apparatus for perforating cigars in bunches, comprising a plate having a plurality of rows of recesses therein spaced and arranged in accordance with the arrangement of the cigars in a bunch of cigars, said plate also having a perforation coaxial with each said recess, a set of needles corresponding to said recesses, and means supporting said plate and set of needles for relative movement whereby said needles simultaneously project through said perforations and into said recesses.

2. Apparatus for perforating cigars in bunches, comprising a plate having a plurality of rows of recesses therein spaced and arranged in accordance with the arrangement of the cigars in a bunch of cigars, said plate also having a perforation coaxial with each said recess, a set of rotatable needles corresponding to said recesses, means resiliently supporting said plate with said perforations alined with said needles so that the needles enter the recesses through the perforations when the plate is moved toward the needles, and means for rotating all of the needles.

3. Apparatus for perforating cigars in bunches, comprising a table, a plurality of fixed posts extending upward from said table, a plate slidable on said posts, said plate having a plurailty of rows of recesses in the upper face thereof spaced and arranged in accordance with the cigars in a bunch of cigars and adapted to receive the ends of cigars, said plate having perforations coaxial with said recesses, a set of needles rotatably mounted beneath said plate in line with said perforations, means resiliently supporting said plate above said needles, and means for rotating all of said needles.

4. Apparatus for perforating cigars in bunches, comprising a table, a plurality of fixed posts extending upward from said table, a plate slidable on said posts, said plate having a plurality of rows of recesses in the upper face thereof spaced and arranged in accordance with the cigars in a bunch of cigars and adapted to receive the ends of cigars, said plate having perforations coaxial with said recesses, a set of needles mounted beneath said plate in line with said perforations, means resiliently supporting said plate above said needles, and means operable to press against a bunch of cigars resting on said plate so as to push said plate down against said resilient supporting means a sufficient distance to cause said needles to project through said perforations and to penetrate into the ends of the cigars.

5. A cup-plate for a cigar perforating machine, said plate having a plurality of rows of recesses in one face thereof spaced and arranged in accordance with the arrangement of the cigars in a bunch of cigars, said plate having a perforation therethrough in the center of each said recess.

6. Apparatus for perforating cigars in bunches, comprising a pair of fixed spaced horizontal bearing plates, guide posts extending upward from the upper of said plates, a movable plate slidable on said posts, compression springs on said posts

between the movable plate and the upper fixed plate, said movable plate having in the upper face thereof rows of recesses shaped and arranged to receive the ends of cigars in a bunch of cigars, said movable plate also having perforations therethrough coaxial with said recesses, spindles journaled in said fixed plates, each spindle having a needle at its upper end coaxial with one of said perforations, means for rotating all of said spindles and needles simultaneously, and a vertically movable presser member spaced above said movable plate and adapted to press down a bunch of cigars placed between said movable plate and presser member with their lower ends seated in said recesses.

7. Apparatus for perforating cigars, comprising a fixed frame, a plurality of rows of vertical spindles journaled in said frame and provided with needles in their upper ends, a vertically movable plate resiliently supported above said needles, said plate having a perforation in line with each said needle and a recess in its upper face coaxial with each perforation, a presser plate movably supported above the perforated plate, means operable to move the presser plate down against a bunch of cigars resting on said perforated plate, and means limiting the downward movement of the presser plate.

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