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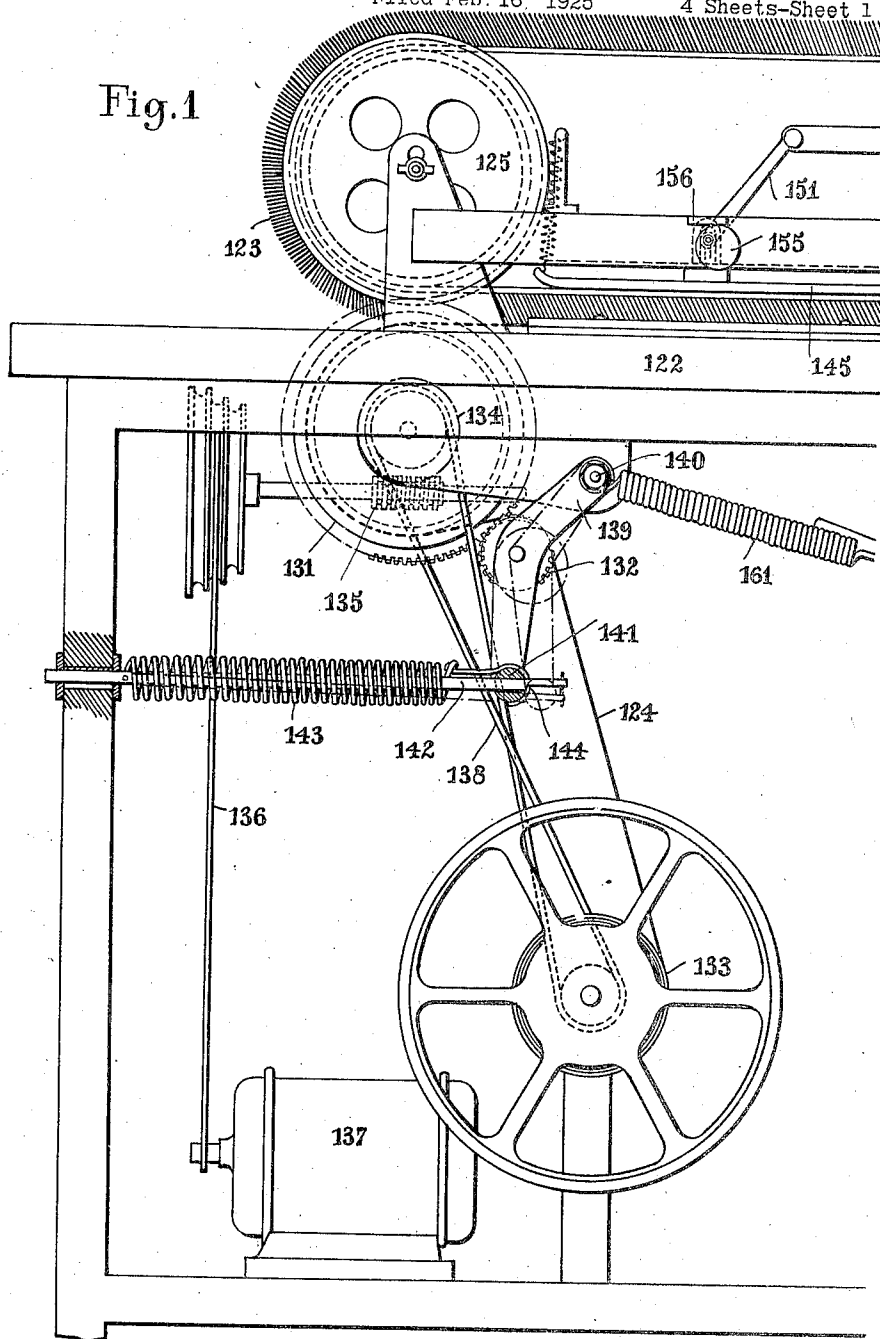
F. H. EELES ET AL
LUMINOUS ELECTRIC SIGN

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4 Sheets-Sheet 1

Fig. 1



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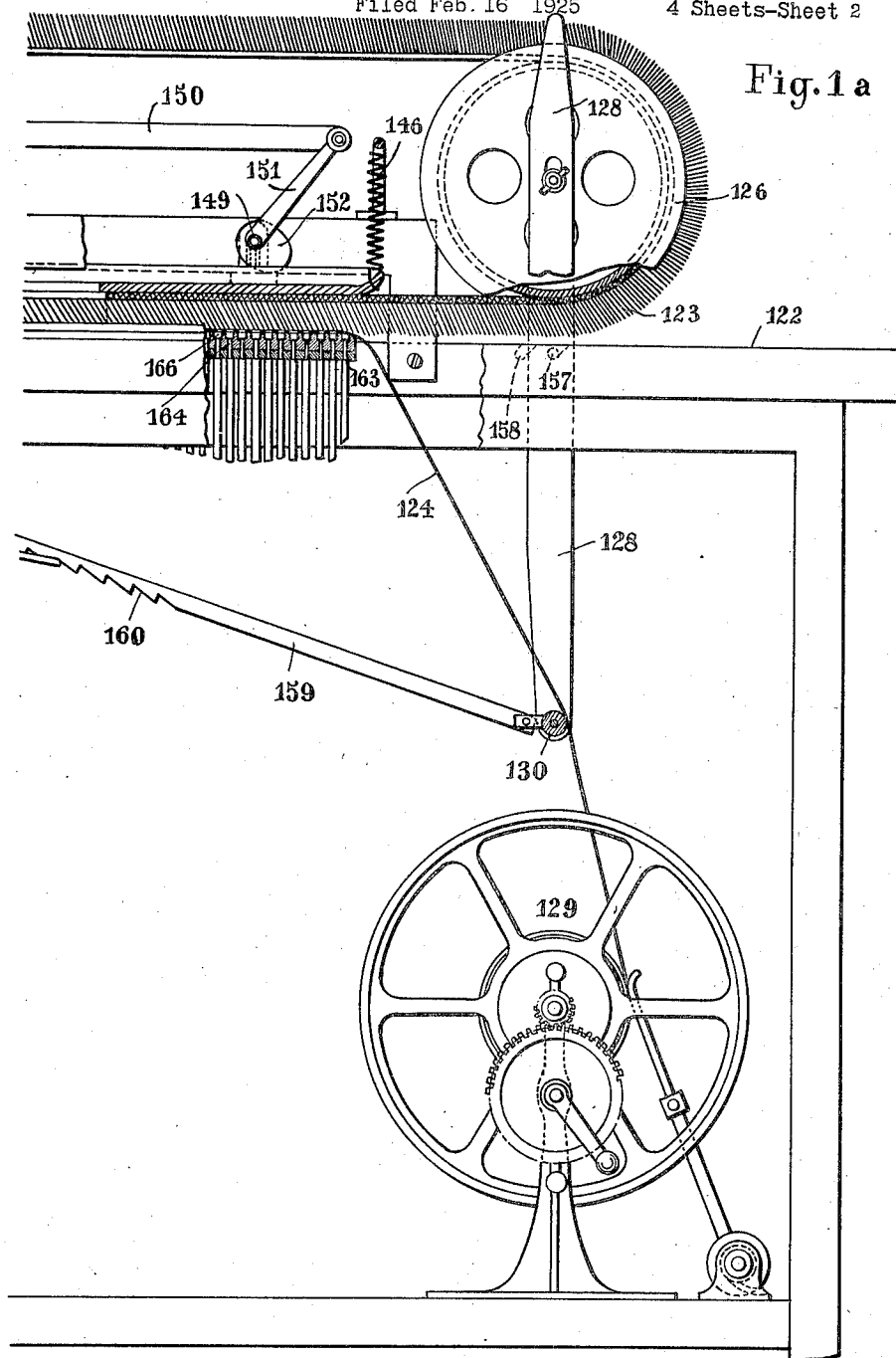
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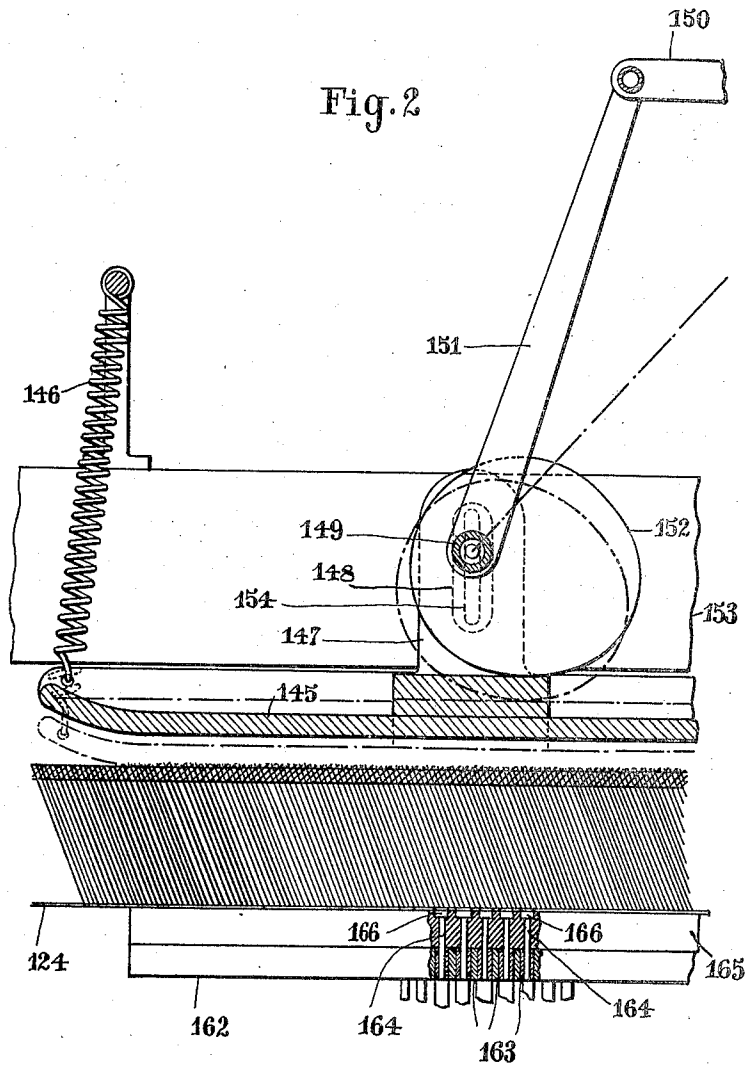
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Fig. 2



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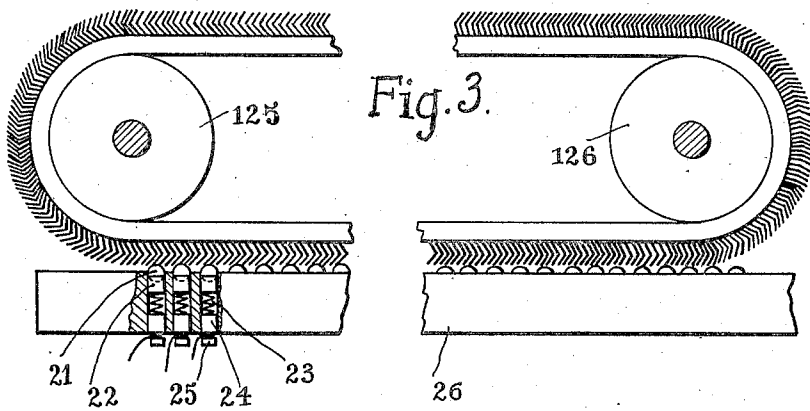
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4 Sheets-Sheet 4



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UNITED STATES PATENT OFFICE.

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LUMINOUS ELECTRIC SIGN.

Application filed February 16, 1925, Serial No. 9,527, and in Great Britain February 18, 1924.

This invention relates to luminous signs or advertisements of the kind which comprises a series of lamps uniformly distributed and in the circuit of which are inserted circuit-breakers grouped so as to correspond to the lamps, these circuit-breakers being adapted to be controlled by the agency of a perforated band which moves relatively to the circuit-breakers and through the perforations of which pass contacts so as to close the circuit through the corresponding lamps.

The invention relates to an arrangement of circuit-breakers formed, on the one hand, by a group of contact-studs individually connected to the lamps which they control, and on the other hand, by a metal brush or card, the perforated band being displaced between the latter and the studs.

The invention also relates to circuit-breakers consisting of a metal brush or card and of studs consisting of spring-pressed balls.

The invention further relates to contact-studs consisting, on the one hand, of sheaths inserted in an insulating plate and connected to the lamp circuits and, on the other hand, of rods arranged in a second insulating plate arranged upon the first and having tight frictional engagement with the said sheaths and the heads of which form the contact-studs proper which are in contact with the metal brush or card.

The invention further relates to a metal brush or card, as one element of a circuit-breaker, this brush or card being formed in the manner of an endless belt passing over two drums which can either be loose or driven.

The invention further relates to a mechanism for positively driving the perforated band and consisting of an actuating drum driven by an electric motor or the like, an intermediate roller interposed between the drum and a winding drum being itself driven by the actuating drum in order to assist in the driving of the band.

The invention also relates to a device for driving the band in which one of the drums of the endless metallic card is given a rotary movement so that the metallic card is displaced at the same speed as the band and assists its forward movement.

The invention also relates to the driving of the driven drum of the metallic card by the driven drum of the perforated band.

The invention further relates to means for applying adjustable pressure, by means of excentrics, the object being to apply the metal brush or card to the perforated band and to thus ensure the contact of the bristles of the card with the contact-studs through the perforations in the said band, the axes of these excentrics being themselves mounted in other excentrics, thus enabling the heights to be regulated.

The invention also relates to a tension device of the endless card consisting in mounting one of the card carrier-drums upon an oscillating arm, the angular position of which can be regulated and maintained by means of a rack upon which the extremity of a tension-spring is attached.

A mode of carrying out the invention is represented by way of example in the accompanying drawings.

In these drawings:

Figs 1-1^a is an elevation, partially in section, of an apparatus of the present system for luminous signs and advertisements;

Fig. 2 is a detail view, on a larger scale, of the device for applying adjustable pressure to the metal brush or card;

Fig. 3 represents an arrangement of the contacts by means of spring-pressed balls and the metallic card.

The luminous advertisement apparatus of the present system is mounted on a table 122 on which is arranged a series of contact-studs uniformly distributed and in the same way as the lamps of the board of lamps of the sign which is not shown. Above this series of contact-studs is placed a metal card 123, of the kind used in the textile industry, and between the contact-studs and the card moves the perforated band 124 in such a way that the bristles of the card pass through the perforations in the band so as to come into contact with the contact-studs which are beneath. This system of establishing contact by the aid of a metal card offers many advantages over the systems at present known and which are generally provided with small elastic tongues, which rub over the contact-studs through the perforations. These tongues

lose their elasticity with use, get out of order easily and thus miss contact the more easily. This cannot happen with the metal brushes or cards, according to the present invention, because they effect a real improvement, first from an economic point of view, as the cards can be made at a very low cost price, moreover in comparison with the surface effectively covered by the card, the amount of space which it takes up is very small, the contact obtained is better and more assured, because it is effected for each of the contact-studs concerned by several points of contact.

This metal card or brush may be fixed, its bristles always making contact practically with the same contact-studs in proportion to the passage of the perforated band which is driven, as will be hereinafter described, but it may likewise be movable, as shown, and thus assist in the driving of the band. It could also, independently of any other means, effect the driving of the band by itself, but it seems preferable to effect this driving by the co-operation of a special mechanism and of the card driven at the same speed, as this avoids all tearing and breaking of the band itself, which is always made of some fragile material, such as paper, celluloid and the like.

In the example shown, the metal card 123 is endless and is mounted on two drums 125 and 126, the first of which is carried by fixed supports 127 attached to the table 122 and the second of which is held in arms 128 of adjustable obliquity.

The perforated band 124 is unwound from a reel 129 mounted beneath the table 122, is passed over a guide bar 130 carried by the ends of the arms 128 and then over the table 122 between the card 123 and the contact-studs, is passed around the actuating drum 131, the guide drum 132 and finally, is wound up on the reel 133. This drum 131 which is designed to drive positively the perforated band 124 is provided, preferably on its periphery with juxtaposed rings of leather which ensure the proper adhesion of the band to the drum. Its shaft carries a worm-wheel 134 which receives its movement from a worm 135 to which a rotary movement is imparted through the medium of the belt 136 and under the control of any kind of motor, for example of an electric motor 137.

The driving drum 131 is connected to the winding-on reel 133 by a crossed belt 138, in order to obtain a winding up of the band corresponding to its driving.

In order to impart a similar movement to the perforated band 124 and the endless card 123, the corresponding cheeks of the drums 125 and 131 are provided on their peripheries with teeth, and for the purpose of ensuring the most efficient driving and

winding up of the band, the intermediate drum 132 is provided with teeth which are adapted to be brought at will into engagement with those of the drum 131 so that the latter can also effectively assist in the driving. This drum 132 may either be kept in gear or out of gear with the drum 131 by the following arrangement. It is carried by arms 139 which are mounted beneath the table 122 so as to be able to oscillate at 140. One of these arms carries on its free end a socket 141 pierced radially and adapted to slide on a rod 142, one end of which is pivoted to the standards of the table 122. On this rod is mounted a spring 143 fixed, on the one hand, to the rod, and on the other hand, to the arm 139, so as to keep the drum 132 normally in contact with the drum 131. The free end of the rod 142 is cut away in order to form a shoulder 144, so that in order to disengage the drum 132 from the drum 131, all that is necessary, is to pull back the arm 139, overcoming the action of the spring 143, so as to cause the socket 141 to slide on the rod 142 and to bring it onto the thinner part thereof, in which position it is held by the shoulder 144, as shown in dotted lines.

The apparatus comprises also a pressure device for applying the card to the perforated band, in order to ensure a better contact of the teeth of this card with the contact-studs through the perforations in the band. This arrangement comprises a shoe 145 of the same width as the card 123 and equal in length to the part of the table 122 which is provided with studs, this shoe being drawn upwards by means of springs 146. On the sides of this shoe are fitted uprights 147 pierced with an elongated slot 148, in which works a spindle 149 carrying an arm 151 and an excentric 152, this latter bearing at its periphery on a cross-bar integral with the shoe 145, and the two arms 151 being connected by a rod 150 which also permits of their being operated simultaneously to cause the excentric to rotate. The spindles 149 pass through a frame 153, attached to the table of the machine and pierced in the same way as the uprights 147, with vertical grooves 154, in order to allow of the movement of the spindle, this latter being kept at any desired height relatively to the shoe 145 by excentrics 155 which it carries externally and which bear on shoulders 156 formed on the frame 153. By reason of this mode of construction, the action of the excentrics 152 on the shoe 145 can be adjusted exactly by previously setting the spindle 149 at any desired height, by a suitable rotation of the excentrics 155 which may be conveniently provided with a scale or graduations adapted to assist in the setting in position.

The tension of the card is ensured by the

special method of mounting the arms 128 which carry the drum 126. These arms are provided with journals 157, which can be seated at will in any one of the notches 158 formed on the table 122 and are connected at their lower ends to a rod 159 by the bar 130 which cross-ties them. This rod 159 has a rack 160, into the teeth of which the end of a tension spring 161 is adapted to engage, the other end thereof being attached to a fixed point of the apparatus, for example at 140. It will be understood that this arrangement for elastic adjustment will permit of easily compensating the expansion which the endless card might undergo as a result of wear, by giving to the arms 128 a more or less accentuated inclination about the journals 157.

Contact might be established by a metal card and contact-studs formed by spring-pressed balls as shown diagrammatically in Fig. 3.

On this figure each circuit-breaker comprises a ball 21 pushed by a piston 22 under the action of a spring 23 bearing against a conducting member 24 into which is screwed the connecting screw 25. All the circuit-breakers are mounted in an insulating plate 26. With the balls 21 co-operates the metal card 123 which can be forced against the balls by means of the device above described. All the metal wires of the brush 123 are connected to one of the terminals of a source of current, whilst each screw 25 is connected to the other terminal through the lamp corresponding to the screw in question.

In the example shown in Figure 1, the contact-studs carried by the table 122 are of more simple construction and are fixed, but may be replaced individually with ease when their action is imperfect.

In an insulating plate 162 are placed metal tubes 163 distributed in the same way as the lamps of the advertising panel or board of lamps and acting as sheaths for metal rods 164 which project from a second insulating plate 165 in which they are loosely mounted, their heads 166 constituting the contact-studs proper with which the bristles of the card come into contact, and the rods 164 fit tightly into their sheaths. The removability of the rods 164 permits of the contact-studs being replaced rapidly and easily in case of wear or of defective working, without interfering with the perfection of the contact.

The band 124, the perforations of which are utilized to put the lamps into circuit, must be perforated for each letter or each character, in a particular manner. Furthermore, in view of the special conditions under which this kind of apparatus is worked, it is necessary that the perforations can be established as required and in a quick manner.

Various modifications of details may also

be made in the arrangements which have just been described without the spirit of the invention being in any way changed thereby.

We claim:

1. In a device as described, a fixed contact plate, a perforated control sheet adapted to pass along said plate, and an endless band having contact bristles extending therefrom and adapted to move in wiping engagement with the surface of said control band opposite the contact plate.

2. In an apparatus of the character described, a fixed contact plate, a perforated control web adapted to move over the plate, and an endless movable card having numerous contact bristles extending therefrom and adapted to wipe over the control web and to enter through the perforations and come into engagement with the contact plate.

3. In an apparatus of the kind described, a fixed contact plate, a continuously moving perforated control web cooperating with said plate, and an endless continuously moving card having numerous contact bristles extending therefrom in wiping engagement with said control web and adapted to pass through the perforations thereof and to make contact therethrough with the fixed contact plate.

4. In an apparatus of the kind described, a fixed contact plate, a perforated web, means for causing said perforated web to pass over said contact plate, an endless card supported above said plate having numerous fine bristles extending therefrom toward the plate and adapted to enter the perforations of the web and to come into contact with said plate for closing the circuit, and means for continuously moving said endless card.

5. A device as described comprising a fixed contact plate, a perforated web adapted to move over the plate, and a movable card having numerous small contact bristles extending therefrom and wiping over the surface of the web, said bristles adapted to pass in numbers through each of the perforations of the card as presented thereto whereby to admit a group of fine bristles through each perforation to the contact plate.

6. A device as described comprising a fixed contact plate, a perforated web adapted to move over the plate, a movable card having numerous small contact bristles extending therefrom and wiping over the surface of the web, said bristles adapted to pass in numbers through each of the perforations of the card as presented thereto whereby to admit a group of fine bristles through each perforation to the contact plate, and means for forcing said card and bristles against the web and plate.

7. A device as described comprising a fixed contact plate, a perforated web adapted to move over the plate, a movable card having numerous small contact bristles extending

therefrom and wiping over the surface of the web, said bristles adapted to pass in numbers through each of the perforations of the card as presented thereto whereby to admit a group of fine bristles through each perforation to the contact plate, and a pressure plate for acting on said card to force the card and bristles against the web and plate.

8. A device as described comprising a fixed contact plate, a perforated web adapted to move over the plate, a movable card having numerous small contact bristles extending therefrom and wiping over the surface of the web, said bristles adapted to pass in numbers through each of the perforations of the card as presented thereto whereby to admit a group of fine bristles through each perforation to the contact plate, a pressure plate adapted to act against the card, and cam means for forcing the card and the bristles against the web.

9. A device as described comprising a fixed contact plate, a perforated web adapted to move over the plate, a movable card having numerous small contact bristles extending therefrom and wiping over the surface of the

web, said bristles adapted to pass in numbers through each of the perforations of the card as presented thereto whereby to admit a group of fine bristles through each perforation to the contact plate, a pressure plate for acting against said card, yieldable means for drawing the plate away from the card, and positive means for acting to force the plate against said card.

10. A device as described comprising a fixed contact plate, a perforated web adapted to move over the plate, a movable card having numerous small contact bristles extending therefrom and wiping over the surface of the web, said bristles adapted to pass in numbers through each of the perforations of the card as presented thereto whereby to admit a group of fine bristles through each perforation to the contact plate, a pressure plate acting against said card to force the bristles against the web and plate, yieldable resilient means for tending to withdraw the plate from the card, and cam means for acting to push the plate against the card.

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