F. M. CASE.

APPARATUS FOR FORMING TAB STOCK.

APPLICATION FILED APR. 1, 1914.

1,211,081.

Patented Jan. 2, 1917.

4 SHEETS—SHEET 1.

FIG. 1.

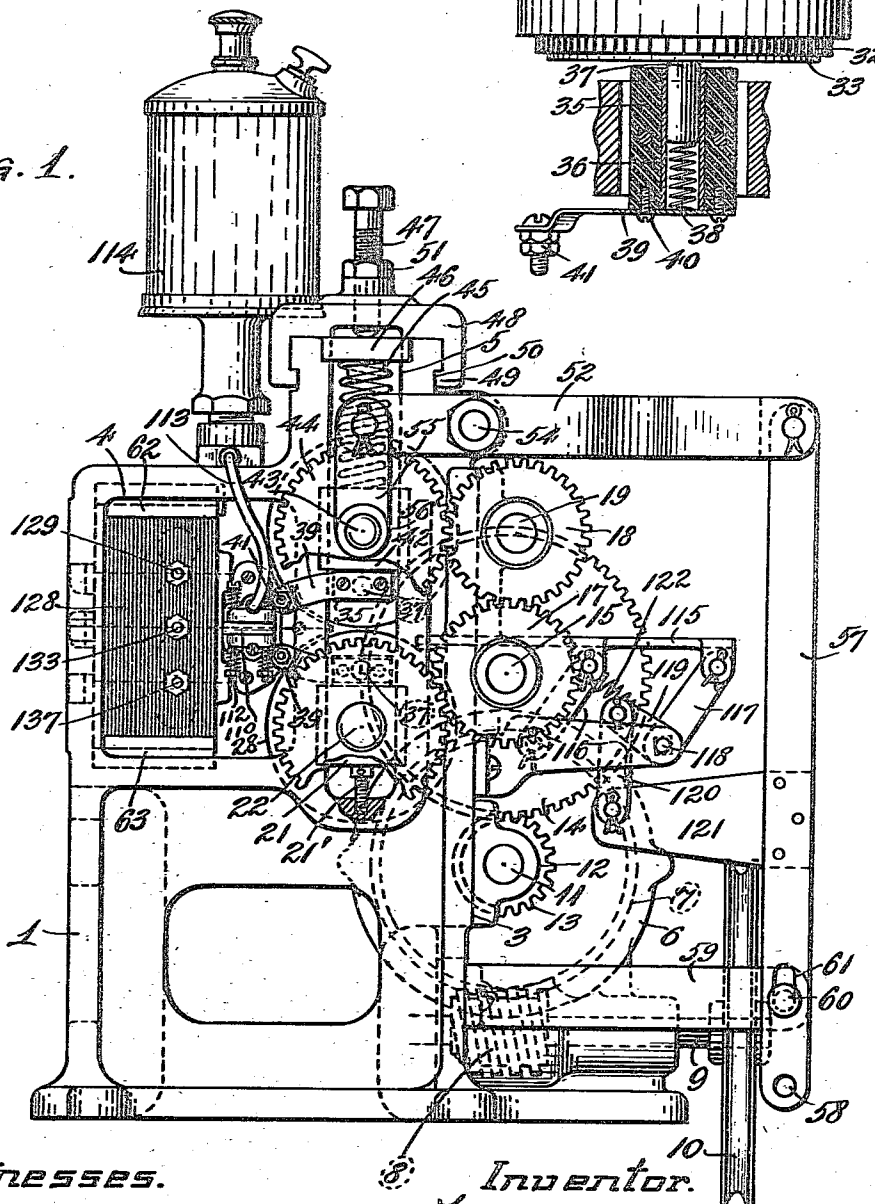


FIG. 2.

Witnesses.

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4 SHEETS—SHEET 2.

FIG. 4.

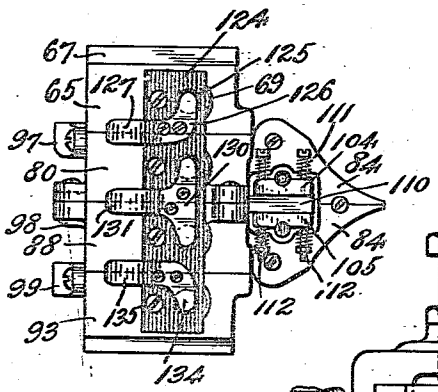


FIG. 5.

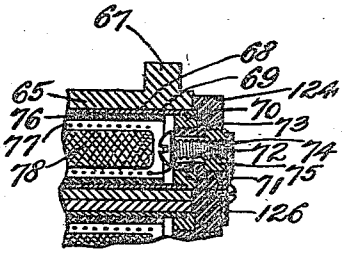
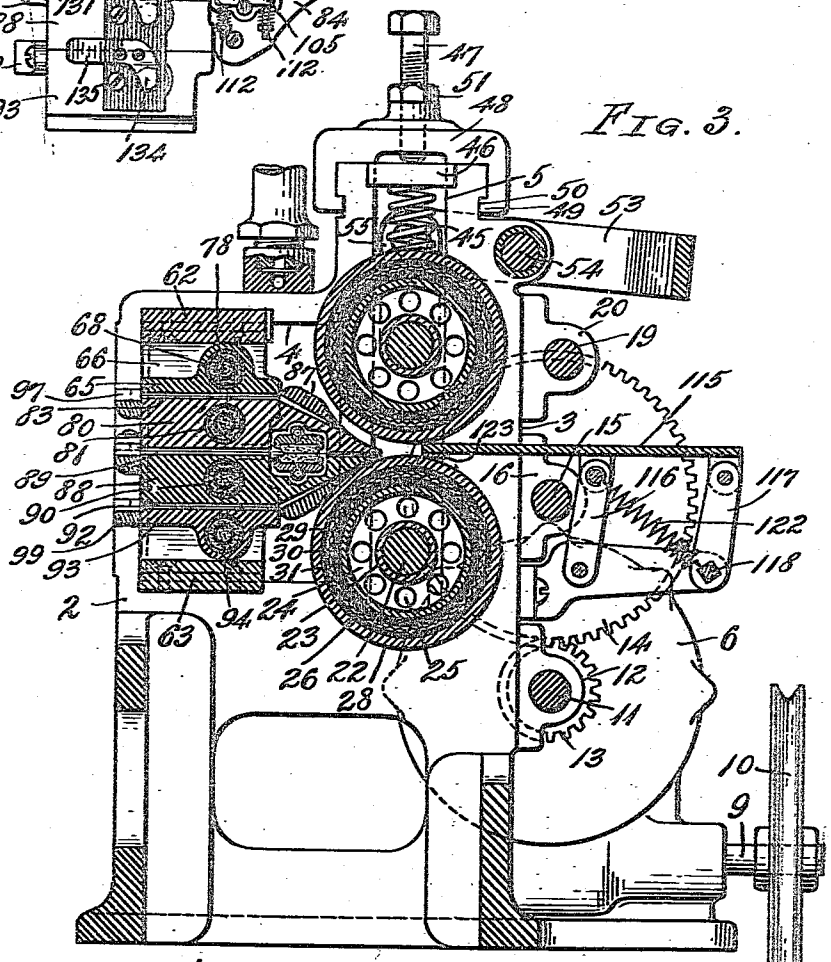


FIG. 3.



Witnesses.

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4 SHEETS—SHEET 3.

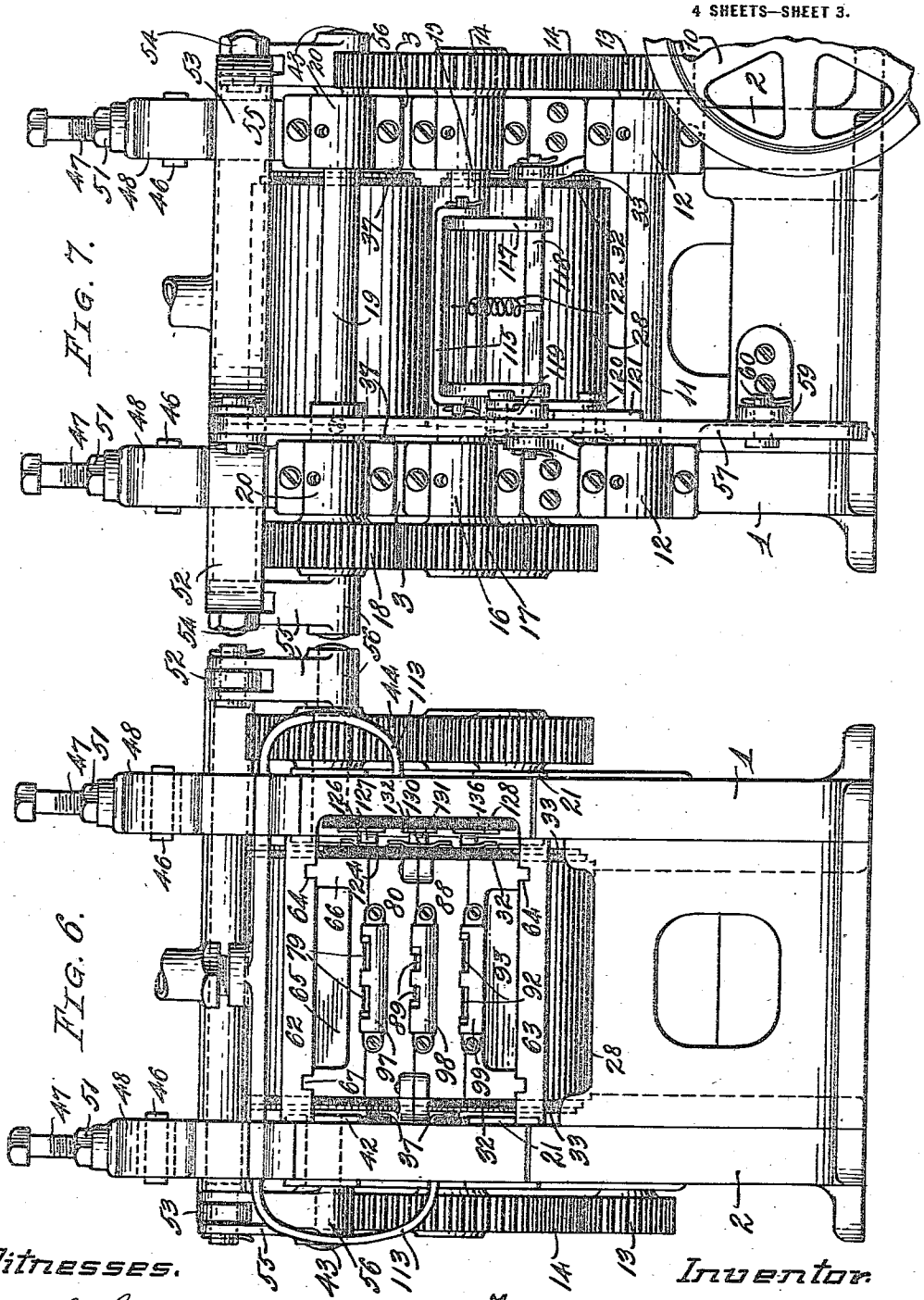


FIG. 7.

FIG. 6.

Witnesses.

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4 SHEETS—SHEET 4.

FIG. 8.

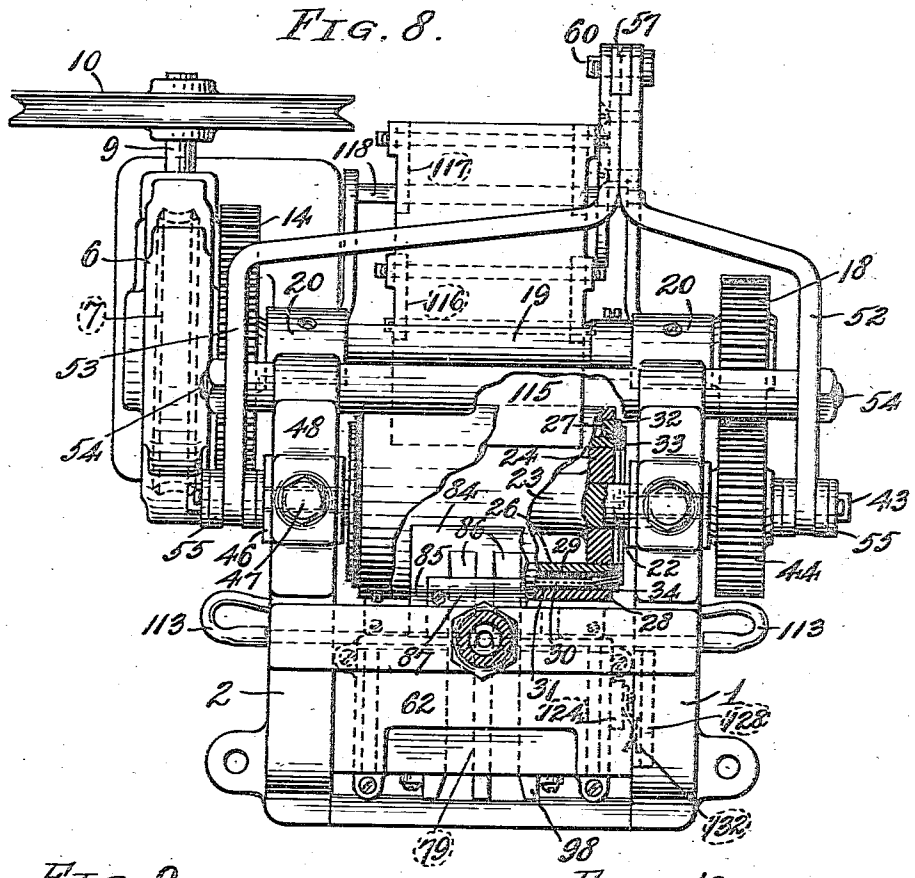


FIG. 9.

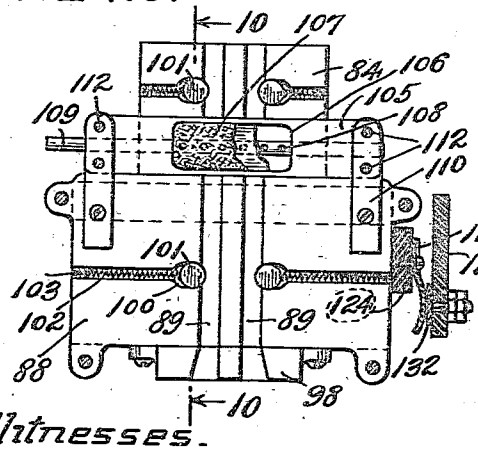
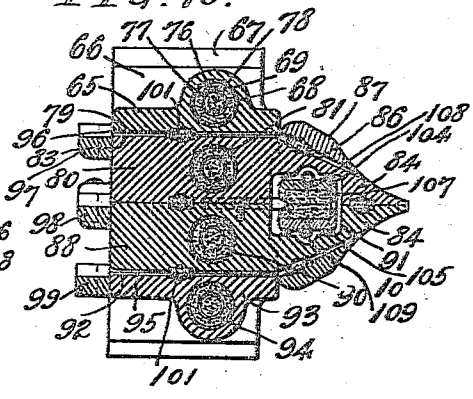


FIG. 10.



Witnesses.

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UNITED STATES PATENT OFFICE.

FRANCIS M. CASE, OF CLEVELAND, OHIO, ASSIGNOR TO J. C. HUB, OF CLEVELAND, OHIO.

APPARATUS FOR FORMING TAB-STOCK.

1,211,081. Specification of Letters Patent. Patented Jan. 2, 1917.

Application filed April 1, 1914. Serial No. 828,879.

To all whom it may concern:

Be it known that I, FRANCIS M. CASE, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Apparatus for Forming Tab-Stock, of which the following is a specification.

This invention relates generally to apparatus for forming tab stock from which index tabs are cut.

More specifically the invention relates to apparatus comprising means for feeding and heating celluloid strips, one above the other with an amalgamating solution applied to one or more of the meeting surfaces, to suitable heated rolls which are adapted to force the strips together and draw the same through the feeding mechanism and at the same time raise the temperature of the strips to a point where complete amalgamation between the same is effected, the feeding mechanism and the parts being arranged so that two wider strips may be amalgamated against the side faces of a relatively narrow main strip so as to form a tab stock comprising a main tab portion of three thicknesses and side plate portions extending therefrom to form side plate securing portions which are to be applied to the faces of the card.

The invention may be further briefly summarized as consisting in the construction and combination of parts hereinafter set forth in the following description, drawings and claims.

Referring to the drawings, Figure 1 is a side elevation of the apparatus; Fig. 2 is a detail view; Fig. 3 is a longitudinal vertical section; Fig. 4 is a side elevation of the feeding and preliminary heating device; Fig. 5 is a detail sectional view showing the connection with the heating element; Fig. 6 is a front elevation; Fig. 7 is a rear elevation; Fig. 8 is a top plan view with parts broken away; Fig. 9 is a top plan view of the lower half of the preliminary heating and feeding device; and Fig. 10 is a vertical section of this device taken upon the line corresponding to the line 10—10 of Fig. 9 but through both halves of the preliminary heater and feeder.

In carrying out the invention any preferred form and construction of parts may be employed so long as they possess the necessary characteristics, but I have shown one arrangement which is effective in operation, and in such embodiment the frame comprises side members 1 and 2 held together by suitable cross frame members secured to the side members in any suitable manner. Each of the side frame members 1 and 2 is provided at the rear with a surfaced edge or face 3 for the reception of the bearings as will later appear. Each frame member is also provided with an opening 4 for a purpose to be described and a vertical guideway 5 also for a purpose to be described. The other features of the frame members will be taken up in connection with the description of the detail parts.

Secured to one of the frame members, preferably the member 2 is a gear case 6 containing any suitable power transmission gearing, such for example, as a worm wheel 7 and worm 8 indicated in dotted lines in the drawings, the worm wheel being connected to a driving shaft 9 provided with a driving pulley 10 and the former being connected to a counter shaft 11 mounted in bearings 12 secured to the edge faces 3. This shaft is provided with a spur pinion 13 meshing with a spur gear 14 in turn mounted upon a roll gear driving shaft 15 supported in bearings 16 upon the frame. This shaft 15 is provided outside of the frame member 1 with a roll driving gear 17 which normally meshes with a roll driving gear 18 of like size mounted upon an upper roll driving shaft 19 supported in bearings 20 secured to the faces 3 of the side frame members. Mounted in the lower ends of the guideways 5 formed in the side frame members 1 and 2 are bearing blocks 21 supported in the guideways by suitable screws 21′. These blocks support a lower roll driving shaft 22 which extends across between the two frames and carries upon it a lower amalgamating roll consisting of an inner sleeve member 23 having end flanges or webs 24 provided with suitable openings 25, as shown in Fig. 3, for ventilation, and a heater coil supporting sleeve 26 having an outwardly extending flange 27 at each end adapted to be engaged by the outer sleeve 28. Within the chamber between the sleeve 26 and flange 27 is a heating element comprising an insulating sleeve 29, a coil 30 surrounding the same and an outer insulating sleeve 31. This heating element is

formed in this chamber before the outer sleeve 28 is applied. In order to supply current to the coil 30 a suitable collector ring structure is provided on each side of the amalgamating roll, and each of these structures comprises an insulator ring 32 and a metal collector ring 33, these parts being held together by suitable screws passing into the flange 27. The insulating ring 32 is provided with a suitable insulating tubular member 34 passing through an opening in the flange 27 and adapted to permit the passage of a lead from the collector ring to the coil 30. Contact is made with these rings by suitable contact devices, and each of these devices comprises a fiber or other insulating block 35 secured to the corresponding bearing block of the amalgamating roll and carrying a metal contact tube 36 preferably round and supporting a carbon brush 37 forced against the collector ring by a spring 38 mounted in the tube and engaged at the ends opposite to the carbon contact 37 by a contact strip 39 held against the rear end of the insulating block 35 by suitable screws 40. These contact strips are extended out to any suitable and convenient point and are then provided with suitable binding posts 41 of any preferred structure. There is a collector ring and contact device for each end of the two amalgamating rolls. In the case of the lower roll, however, the contacts are arranged upon the upper surface of the bearing blocks 21, as is shown in Fig. 1.

Slidably mounted in the guideways 5 of the side frame members 1 and 2 are upper amalgamating roll bearing blocks 42, which support an upper amalgamating roll driving shaft 43 carrying a roll similar in all respects to the lower roll and therefore needing no further detail description. In the case of this roll, however, the contacts for the current are arranged below the bearing blocks 42, as shown in Fig. 1, for the purpose of bringing the binding posts together at a convenient point. Keyed or otherwise secured to this shaft is an upper roll driving gear 44 meshing with the gear 18 mounted upon the shaft 19.

It is necessary that the upper roll should have a tension toward the roller roll, and this is accomplished by means of a pair of springs 45, one arranged between each of the bearing blocks 42 and a thrust block 46 mounted in the guideway 5 and adapted to be adjustably held in position by an adjusting screw 47 threaded into a clip 48 extending over the top of the frame and having inwardly extending projections 49 engaging in suitable recesses 50 in the frame members. Each of these adjusting screws 47 is held in place by a check nut 51. In the feeding of the strips, as will later appear, it is necessary to open the rolls, and this mechanism consists of a lever structure having bifurcated portions 52 and 53 both pivoted upon a rod 54 extending across the two frame members. The outer ends of these two arms 52 and 53 are connected by suitable link members 55 each having a bearing portion 56 mounted upon the corresponding projected end of the shaft 43 of the upper amalgamating roll. These bifurcated portions 52 and 53 unite at the rear of the machine and are connected to a link or bar 57 provided with an eye 58 at its lower end for connection to any suitable manually operated device, preferably to a foot lever, not shown. In order to guide the lower end of this link, a bracket 59 is secured to the frame and extends out to a point in vertical alinement with the upper pivot of the link 57 and is there provided with a pin 60 extending through a slot 61 arranged in the link. It is obvious from the foregoing description that when the link 57 is pulled down, the upper amalgamating roll will be raised against the tension of the springs 45.

The strips of celluloid to be operated upon by the amalgamated rolls are fed by a combined preliminary heating, feeding and treating mechanism, and this mechanism is supported between an upper guiding plate 62 and a lower supporting and guiding plate 63, each plate being provided near each end with a guideway 64. The preliminary heating, feeding and treating element, as a whole, is slid in between these plates 62 and 63 and guided by the guideway 64. This mechanism consists preferably of an upper heating and guiding member 65 provided on its upper surface and near each end thereof with an upwardly extending web 66 having a transverse guiding rib 67 adapted for engagement in the corresponding recess of the upper guiding plate 62. This member is also provided with preferably a cylindrical opening 68 extending longitudinally through the same and adapted to receive a heating element, and since the heating elements of this preliminary heating, feeding and treating mechanism are substantially the same, the description of one at this point will apply to all.

Each heating element comprises a metal sleeve 69 preferably of brass having threaded, or otherwise secured in the end thereof, a head 70 having a central opening 71 which receives an insulating sleeve 72 provided with a flange 73 engaging on the outside of the head 70. Passing through the sleeve 72 is a screw 74 with the head on the inside of the element and provided on the outside of the flange 73 with a nut 75. This screw and nut is therefore insulated from the head 70 and the tube 69 and forms one of the contacts for the elements. Arranged on the inside of the tube 69 against the wall thereof is an insulating sleeve or tube 76 preferably

of asbestos, and within this is a heating coil 77 arranged about an insulating core 78. One end of this coil is connected under the head of the screw 74 at one end of the element, and the other end of the coil is connected under the other similar screw at the opposite end so that the current leads into the heating element at one end and at the other.

The upper heating and guiding member 65 is provided on its under surface with one or more grooves 79 extending transversely thereof, and these grooves receive strips of celluloid forming the side plate portions of the tab stock. This member has a flat bottom face, and this face engages the corresponding face of the upper intermediate heating and guiding member 80 which is provided with a longitudinally disposed opening 81 for receiving a heating element 82 corresponding in all respects to the heating element already described. It is also provided on its upper surface with a pair of grooves 83 which are located in alinement with the grooves 79 and these grooves together form the guideway for the side plates of the tab stock. This upper intermediate heating and guiding member 80 is provided with a rearwardly extending portion 84 inclined downwardly and outwardly beyond the back of this mechanism and cut away at the center from front to back to form end flanges 85 which are curved out to follow the periphery of the upper amalgamating roll when the rolls are closed. The upper face of this extension 84 between the projections 85 is provided with grooves 86 in alinement with the grooves 79 and 83 and forming a continuation thereof.

In order to hold the celluloid strips in the groove 86 an upper plate 87, as shown in top plan in Fig. 8, is provided and this plate corresponds in cross section to the cross section of the flanges 85. The upper intermediate heating and guiding member 80 is secured to a lower intermediate heating and guiding member 88 having its parts arranged in opposition thereto, as shown in Fig. 10, and the meeting faces are provided with transverse grooves 89, shown in plan in Fig. 9, these grooves being less in width than the grooves 79 and 83 and arranged so that the spacing between the grooves is the same in all cases whereby the inner edges of the grooves 89 are in vertical alinement with the inner edges of the grooves 79 and 83. These grooves 89 are for receiving the intermediate celluloid strips of stock. This lower intermediate heating and guiding member is provided with a heating element 90 similar to the other heating elements. Each of the extensions 84 of the intermediate heating and guiding members is provided with a longitudinally disposed recess 91 and these recesses form an opening for receiving the solution appliance to be described. The under face of the lower intermediate heating and guiding member is provided with recesses 92 similar to those referred to in connection with the corresponding upper members and these receive the other celluloid side plate portions of the tab stock and feed them in a similar manner against the intermediate strip of the tab stock as will later appear. Coöperating with this lower intermediate heating and guiding portion is a lower heating and guiding portion 93 provided with a heating element 94 and suitable grooves 95 coöperating with the recesses 92. In order to facilitate the entry of the strips into the several grooves or openings, the lips thereof may be beveled, as shown at 96 in Fig. 10, and suitable extending brackets 97, 98 and 99 may be arranged on the face of the entire heating, feeding and guiding element for supporting the stock in placing it in the openings. In order to force all of the strips toward the center so that the corresponding edge of all the three strips of each piece of stock will be in vertical alinement, I provide the several members at their meeting faces with suitable recesses 100 for receiving pressure blocks 101 preferably round in configuration with the curved edge tangent to the axis of the slot or recess with which it coöperates, and each of these blocks is forced inward toward the slot, as shown in Fig. 9, by a suitable spring 102 held in place by a screw or plug 103. There is one of these pressure blocks at substantially the center of the several members forming the main body portion of the heating mechanism for each slot or recess, and one on each side of the slots which pass through the extensions 84 of the intermediate heating and guiding mechanism.

The treating device comprises an upper plate member 104 and a lower plate member 105, both being provided with a central rectangular shaped aperture, as shown at 106 in Fig. 9, for receiving a suitable wick or pad 107 for holding an amalgamating solution. Each pad is fed by suitable openings 108 extending through the plate and leading to a feed tube 109, there being a feed tube for each plate, the feed tube of one member extending out on one side of the machine, and the feed tube for the other member extending out on the opposite side. These plates at their ends engage suitable supporting strips 110 fastened between the intermediate heating and guiding members and they are yieldingly held against these supporting strips by suitable springs 111 and bolts 112, which pass through suitable openings in the two plates and through openings in the strips 110, there being one of the springs 111 above the upper plate and one below the lower plate on the same bolt, as shown, so that these plates are held to-

gether against the supports and the wicks or pads are brought yieldingly into engagement with each other. Solution is supplied to this treating device through suitable tubes 113 connected to a reservoir 114.

In feeding the strips to the amalgamating rolls, it is necessary to have a stop limit the inward movement of the celluloid strips while they are being arranged ready for amalgamation, and this is taken care of by providing a plate 115 at the rear of the machine and supporting it upon parallel link members 116 and 117, the links 117 at the rear being secured to a shaft 118 extended out and provided with a crank arm 119 connected by a link 120 with a bracket 121 secured to the link 57. A spring 122 tends to pull this plate to the rear. This plate may be provided with an extra strip 123 for filling up the entire opening between the rolls.

In order to supply current to the several heating elements of the preliminary heating, feeding and treating mechanism, I secure an insulating block 124, as shown in Fig. 4, to the end face of this mechanism and provide this block with suitable openings 125 for receiving the nut 75 of the contact screw 74, and these nuts project well through this block, as shown in Fig. 5, the uppermost contact 75 engaging a leaf contact 126 secured to the block and having a metal tongue 127. This tongue engages a contact strip carried by an insulating contact block 128 secured to the machine in any suitable manner near the end of this mechanism and secured to the blocks by a suitable binding screw 129 connected to one of the wires of the electrical circuit. The two contact nuts 75 of the intermediate elements engage a common leaf contact 130 secured to the block 124 and having a tongue 131 for engagement with a contact 132 held in place by a bolt 133 forming a binding post. The lower element has its contact engaging a leaf contact 134 having a spring tongue 135 engaging the contact strip 136 carried by the block 128 and secured in place by a bolt 137 forming a binding post.

The mechanism is utilized in the following manner: Assuming that current is supplied to the preliminary heater either by connecting to the binding posts 129 and 137 so that all of the heating elements are connected in series, or by connecting one line to the binding posts 129 and 137 and the other line to the binding post 133 when the elements will be connected in multiple, and further assuming that the current is led to the binding post 41 so that the heating elements in the amalgamating rolls are supplied with current, and still further assuming that these elements have been subjected to current for a sufficient length of time to heat the parts, the operator shifts the link 57 causing the upper roll to be elevated. This operation, however, causes the gage plate 115 to be moved in between the rolls. The three strips of celluloid are then fed in the slots and pushed inward until the ends abut against the end of the gage plate. The operator then releases the link 57 causing the amalgamated rolls to move together against the three strips which have been previously heated. The middle strip in passing through the several parts, however, has been moistened with a solution from the pads 107 and by the action of the heat has been softened on its surface, so that when the amalgamating rolls press the three strips together and act upon the same with their own heat and with pressure amalgamation takes place, and the three strips are bound together forming a homogeneous tab stock with a solid portion comprising the three strips and with lateral extensions which form side plates for engaging the card after the tabs are cut from the stock.

Having described my invention, I claim:—

1. Apparatus for forming celluloid tab stock, comprising a guide for the central body strip, means for applying a solution to both sides of the body strip, means for guiding side plate portions into position upon the opposite faces of the main body strip, and means for applying pressure and heat to the several strips to amalgamate the same.

2. Apparatus for forming celluloid tab stock, comprising means for guiding several strips into contact with each other, means for applying a solution between the strips, means for heating the strips before they contact with each other, and means for applying pressure and heat to the several contacting strips to amalgamate the same.

3. An apparatus for forming tab stock comprising means for feeding a plurality of strips of celluloid, means for applying an amalgamating solution between the strips, a pair of pressure rolls, means normally tending to force said rolls together, means for bringing about a relative movement of said rolls to separate the same, and a gage for the strips adapted to enter between the rolls when separated.

4. An apparatus for forming tab stock comprising means for feeding a plurality of strips of celluloid, means for applying an amalgamating solution between the strips, an amalgamating roll, another amalgamating roll, means for driving said rolls, means for moving one of said rolls bodily with respect to the other, and a gage actuated by said roll moving means and adapted to enter the space between said rolls when separated and form a stop for the strips.

5. An apparatus for forming celluloid tab stock comprising means for amalgamating the same, a feeding mechanism for the strips and comprising a device having a plurality

of separated guiding openings one for each strip, and means arranged between the strips for applying an amalgamating solution between the strips.

6. An apparatus for forming celluloid tab stock comprising means for amalgamating the same, and feeding mechanism for the strips comprising a device having a plurality of separated guiding openings arranged in alinement so as to cause the strips to be fed one upon the other, and a solution applying device arranged between adjacent strips and adapted to feed amalgamating solution thereto.

7. An apparatus for forming celluloid tab stock comprising means for amalgamating the same, and feeding mechanism for the strips comprising a device having a guiding opening for receiving the main body strip of the stock and another opening spaced therefrom for receiving a side strip, and a solution applying device arranged in the device between the opening for the main body strip and the opening for the side strip and adapted to apply solution to the face of the main body strip.

8. An apparatus for forming celluloid tab stock comprising means for amalgamating the same, and feeding mechanism for the strips comprising a device having an opening for receiving the main body strip, and an opening on each side thereof spaced therefrom for receiving the side plate strips, all of said openings being in vertical alinement to cause the strips to be fed one against the other, and a solution feeding device arranged on each side of the body strip and between it and the side strips.

9. An apparatus for forming celluloid tab stock comprising means for amalgamating the same, and feeding mechanism for the strips comprising a device having an opening for receiving the main body strip, and an opening on each side thereof spaced therefrom for receiving the side plate strips, all of said openings being in vertical alinement to cause the strips to be fed one against the other, and a solution feeding device arranged on each side of the body strip and between it and the side strips, each solution device comprising a plate having a pad, means for applying amalgamating solution thereto, and means for bringing said pads against the sides of the strip.

10. An apparatus for forming celluloid tab stock comprising means for amalgamating the same, and feeding mechanism for the strips comprising a device having an opening for receiving the main body strip, and an opening on each side thereof and spaced therefrom for receiving the side plate strips, all of said openings being in vertical alinement to cause the strips to be fed one against the other, a solution feeding device arranged on each side of the body strip and between it and the side strips, and means arranged in said device for forcing the corresponding edges of the strips against the sides of their opening.

11. In apparatus for forming celluloid tab stock comprising means for amalgamating the same, and feeding mechanism for the strips comprising a device having an opening for receiving the main body strip, and an opening on each side thereof and spaced therefrom for receiving the side plate strips, all of said openings being in vertical alinement to cause the strips to be fed one against the other, a solution feeding device arranged on each side of the body strip and between it and the side strips, guiding blocks arranged in the device one coöperating with each opening and adapted to engage the edge of the strip and force the opposite edge against the wall of the opening, and means for yieldingly forcing said blocks in the proper direction.

In testimony whereof I affix my signature in presence of two witnesses as follows.

FRANCIS M. CASE.

Witnesses:
C. H. TRESCH,
G. O. FARQUHARSON.