

No. 704,091.

Patented July 8, 1902.

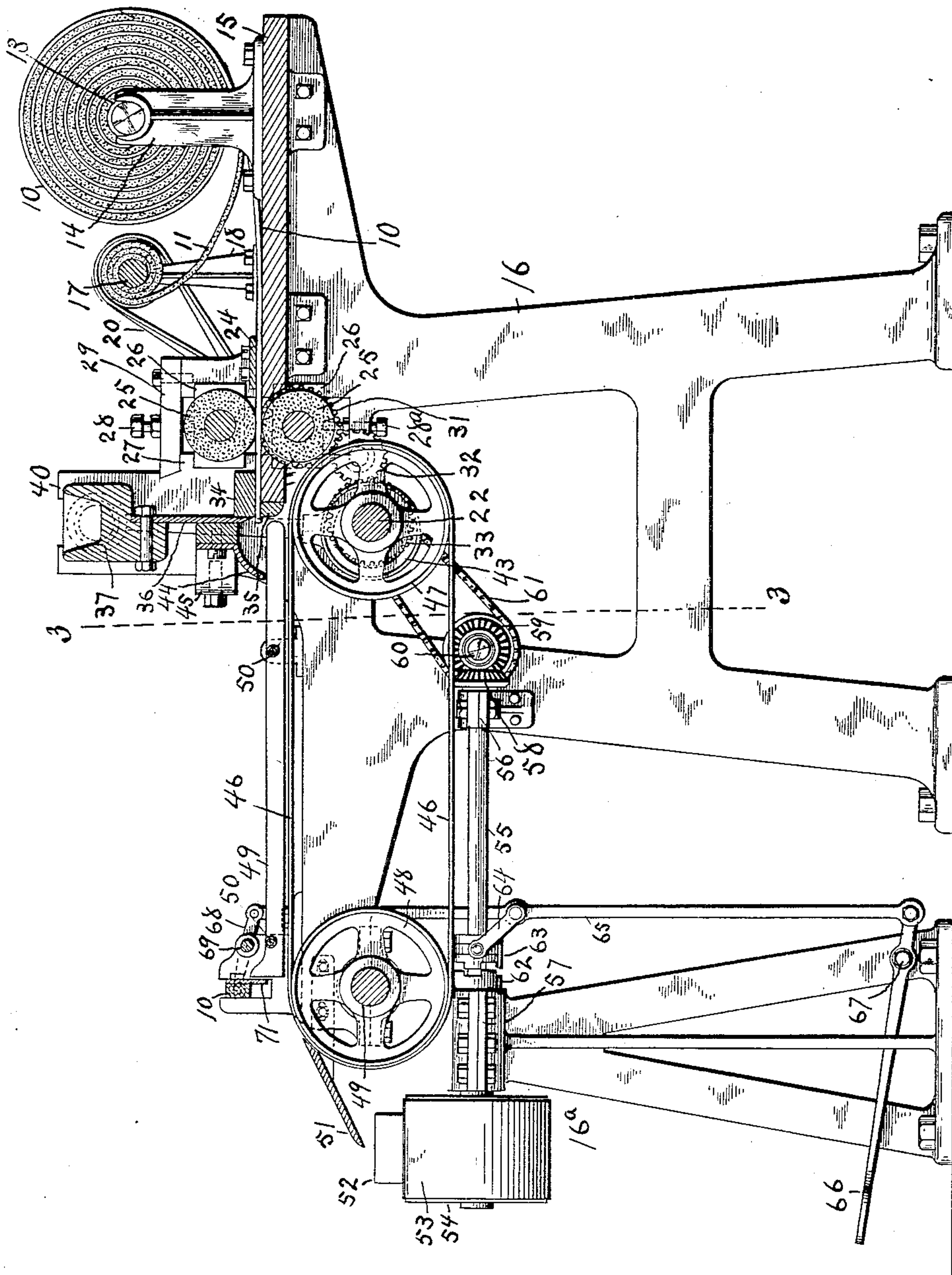
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PROCESS OF MAKING MATCHES.

(Application filed Sept. 23, 1901. Renewed June 9, 1902.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES:

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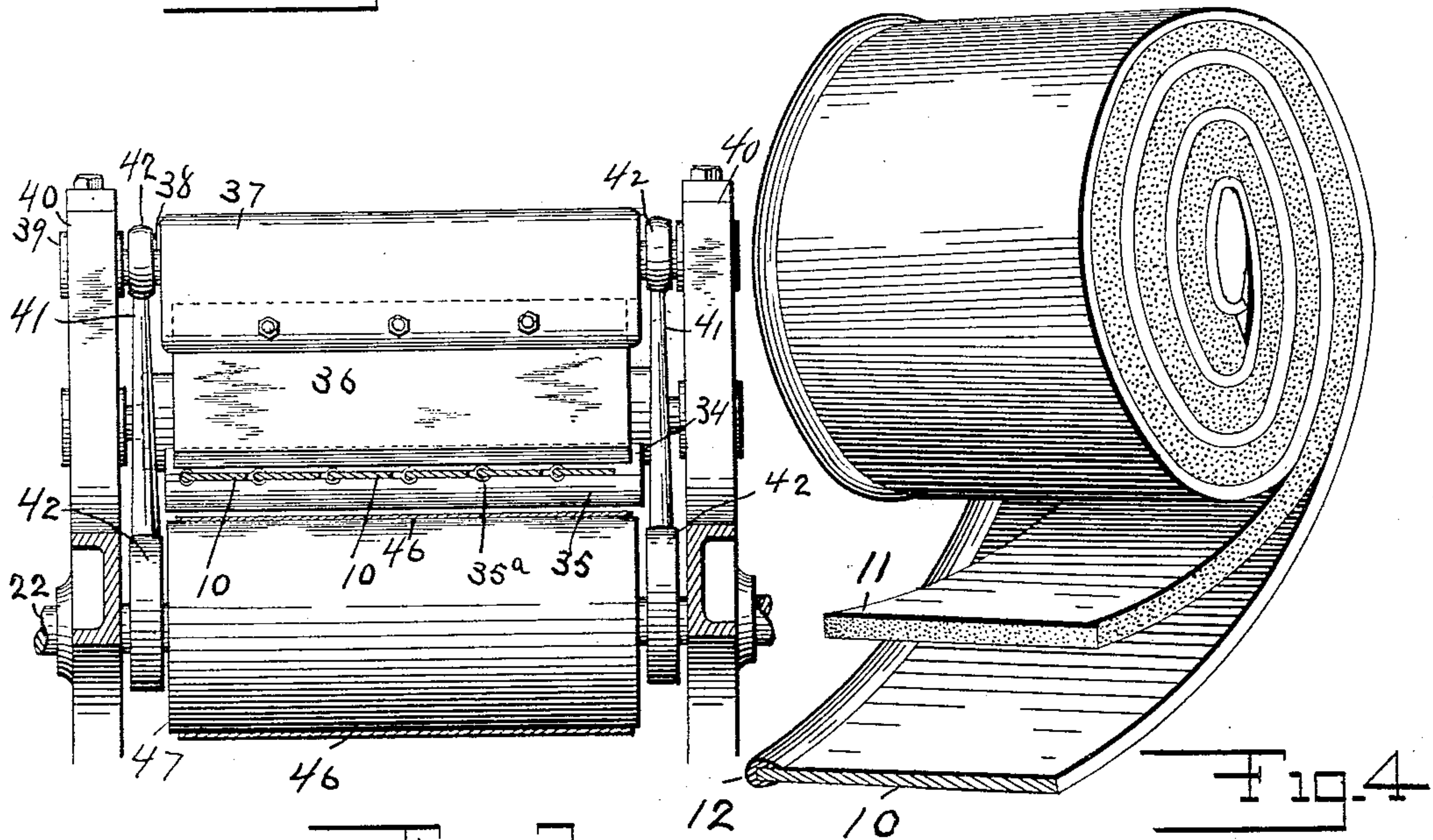
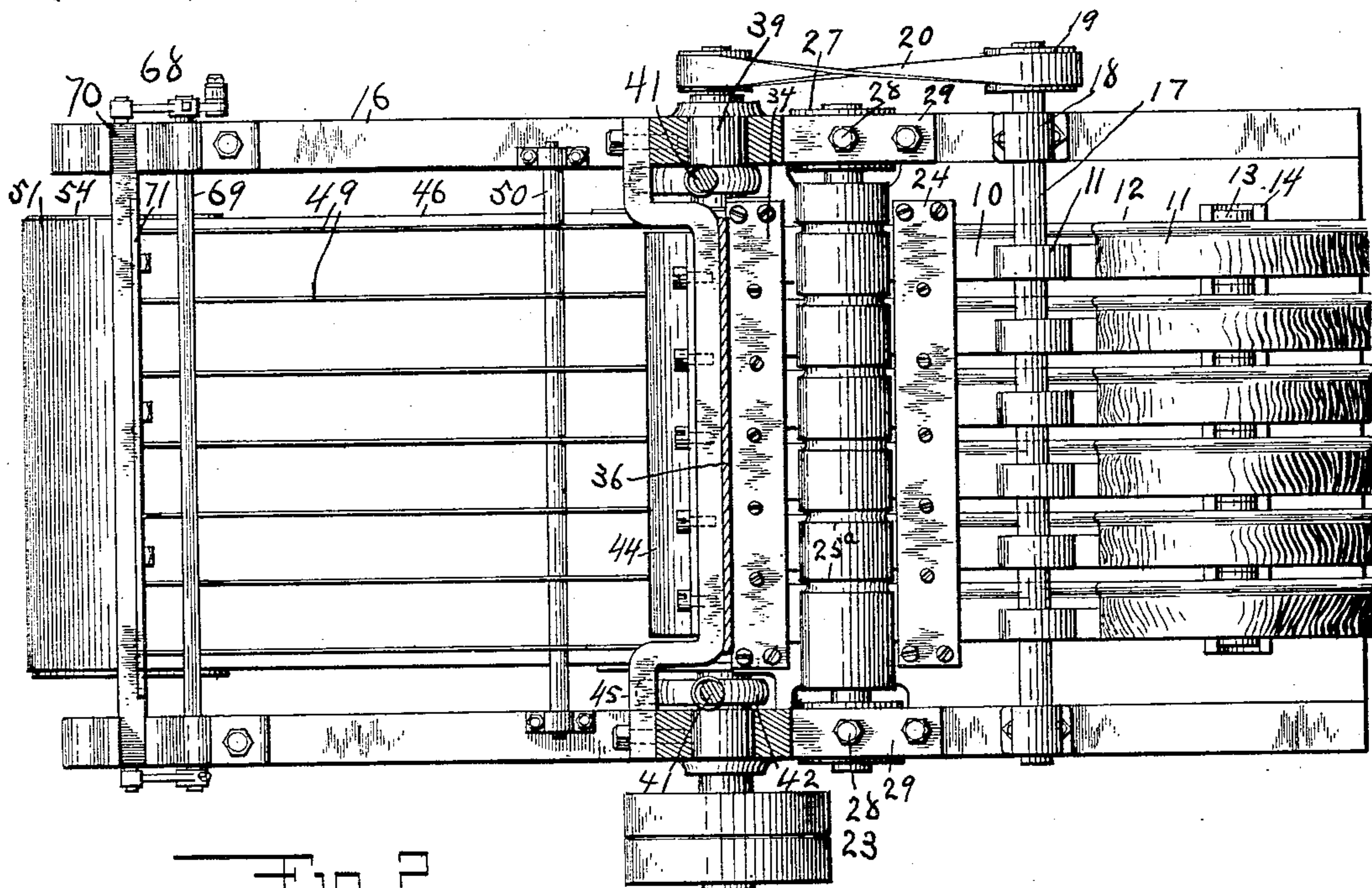
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UNITED STATES PATENT OFFICE.

WILLIAM H. PARKER, OF MELLENVILLE, NEW YORK, ASSIGNOR, BY MESNE ASSIGNMENTS, TO PARKER MATCH COMPANY, A CORPORATION OF NEW JERSEY.

PROCESS OF MAKING MATCHES.

SPECIFICATION forming part of Letters Patent No. 704,091, dated July 8, 1902.

Application filed September 23, 1901. Renewed June 9, 1902. Serial No. 110,903. (No specimens.)

To all whom it may concern:

Be it known that I, WILLIAM H. PARKER, of Mellenville, Columbia county, New York, have invented certain new and useful Improvements in Processes of Making Matches, of which the following is a full, clear, and exact description.

My invention relates to improvements in the manufacture of matches.

It is well known that the usual practice in making matches is to cut the match-splints either from veneer strips or blocks of wood and gather the splints in some sort of a carrier or holder, either as they are cut or after they are cut, preparatory to dipping them in the several necessary compositions. Perhaps the most difficult part of this operation is that of properly securing and dipping the splints. It is well known that great ingenuity has been displayed in providing suitable carriers for this purpose.

The object of my invention is in the main to dispense with the use of a carrier or gatherer of any sort in the manufacture of matches, to dip the wood in the requisite compositions before the splints are cut, and also provide means for collecting and straightening the splints or matches as they leave the cutter, so that they may be conveniently boxed. It will be seen that this dispenses with the greater part of the ordinary match-making machine and vastly cheapens the manufacture of matches. In carrying out this idea I use veneer strips, each strip having a width corresponding to the length of the match. I separate the edges of the strips preferably by rolling up in each veneer strip a belt of some light material which will hold the edges of the strip or strips the necessary distance apart, then dip one edge of the veneer strip into the necessary compositions, such as paraffin and the firing compound, and after this is set I then cut the veneer strip or strips into matches. Obviously this method is not applicable to what is known as the "strike-anywhere" match, for with material of this kind the firing composition would be ignited when the cutting-off knife passed through it; but I have found by experimenting that the composition known as the "safety" composition—that is, the kind that

strikes only on some especially-prepared surface—can be safely cut with a knife, and while this leaves a head which is not quite as handsome as that of the ordinary match still it is to all intents as good and, as above remarked, much cheaper.

In the accompanying drawings I have shown a match-machine which is intended to carry out the above-described method. It will be noticed, too, that I have shown a veneer strip with the firing composition on one edge only; but it will of course be understood that, if desired, the firing composition can be applied to both edges and the matches cut in two after they are made, as it is already the common practice to provide individual splints with two heads and then cut them in two.

With these ends in view my invention consists of a process of making matches, which will be hereinafter fully described and claimed.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar figures of reference refer to similar parts throughout the several views.

Figure 1 is a longitudinal sectional elevation of the machine embodying my invention. Fig. 2 is a plan view of the machine. Fig. 3 is a cross-section on the line 3 3 of Fig. 1, and Fig. 4 is a perspective view showing the arrangement of the veneer strip when it is ready for the machine.

In carrying out my invention I use a machine which is intended to be used for cutting strips of veneer 10 (see Fig. 4) into matches, and this veneer strip has its width corresponding to the length of the matches to be cut. The veneer strip is rolled up with a belt 11, which is narrower than the veneer strip, so that one edge of the strip will project beyond the edge of the belt, as the drawings clearly show, and the belt should be of such a thickness as to separate the adjacent portions of one edge of the strip when it is rolled up, so that when the said edge is dipped in the firing compositions the parts which are to form the head will not touch. Obviously any suitable means might be used for separating the parts of the roll of veneer, and likewise it is evident that straight veneer strips might be used with some separating medium

between them; but the roller form is preferably used, because the material can be handled better in this way. Several of the rolls of veneer (the machine illustrated provides 5 for six) are mounted on a spindle 13, which is placed transversely on suitable supports 14 at the front end of the machine, these being supported on the table 15 of the frame 16, as best shown in Figs. 1 and 2. As the veneer strips 10 are fed into the machine along the table-top the belts 11 are wound on a shaft 17, (see Fig. 1,) ready for use again, while the veneer strips go forward to be cut into matches, as presently described. The shaft 15 17 may be turned in any convenient way; but, as illustrated, it is journaled in suitable supports 18, which should be constructed so as to permit the removal of the shaft, any ordinary means being suitable, and the shaft has 20 a pulley 19, driven by a belt 20, which connects with a pulley 21 (see Fig. 2) on the driving-shaft 22. This latter shaft is journaled transversely in the shaft 16 and provided with the ordinary type of loose pulleys 23, although, of course, it may be driven in any convenient way. The several veneer strips pass into the machine in parallel relation beneath the flat guide 24, which is stretched transversely across the machine, and they are 30 caught and fed rearward by the feed-rollers 25. These rollers are not shown as geared together, but they may be, if desired, and the rollers have at regular intervals the annular grooves 25^a. (See Fig. 2.) It will be seen by 35 reference to Fig. 4 that when the veneer strip 10 is dipped the head portion 12 is necessarily enlarged, and the object of the grooves 25^a is to receive this headed portion of the several strips, so that the said composition part of 40 the matches will not be injured. The feed-rollers should be adjustable up and down, as is usual in such cases, and any usual means can be employed. As illustrated, the rollers are journaled in boxes 25, which move up and down 45 in ways 27, and the boxes are adjustable by the set-screws 28 and 28^a, the former extending downward through the top plates which cover the ways 27 and the latter extending up through a part of the machine-frame 16. 50 Obviously any usual means may be employed for driving the feed-rollers; but, as illustrated, the lower roller is provided with a gear-wheel 31, (see Fig. 1,) which is driven by an intermediate gear 32, rolled on the frame 16, and 55 the said intermediate gear is driven by a gear 33 on the driving-shaft 22. The veneer strips after passing the feed-rollers (see Fig. 1) pass through the two-part cutter-block 34 35, which is arranged transversely in the machine and 60 the back portion of which presents a smooth surface, against which the vertically-reciprocating knife 36 slides. The cutter-block is grooved at 35^a to permit the passage of the part 12 of the veneer strip. The knife 36 may 65 be reciprocated in any usual way, and I have illustrated a very common means in which the knife is shown as bolted to a cross-head 37,

which is provided with end trunnions 38, (see Fig. 3,) and these have rollers 39, which move up and down in the ways formed in the upwardly-extending parts 40 of the frame 16. The knife is timed in relation to the feed-rollers 26 so that on the upstroke of the knife the several veneer strips will be fed into the machine the width of a match-splint and on 75 the descent of the knife the splints will be formed by cutting off the projecting ends of the several strips 10.

Any usual means may be employed for moving the cross-head 37; but I have shown connecting-rods 41, which at their upper ends 80 have rings 42, which engage the trunnions 48 on the cross-head, and at their lower ends the rods 41 connect with the eccentric-straps 42^a, which are guided by eccentrics 43 on the driving-shaft 22, so that the turning of the shaft causes the reciprocation of the cross-head. 85

To prevent the matches from flying when cut, a hood 44 is used, (see Fig. 1,) which extends transversely across the machine and 90 which is attached to a cross-bar 45, bolted to the machine-frame.

As the matches are cut from the several strips 10 they fall upon an endless belt 46, which is preferably of metal, so as to be smooth, 95 and the upper member of which is a little lower than the table 15, but is horizontal and forms practically a continuation of the table. The belt 46 is wide enough to receive the matches cut from the several strips 10, and it 100 is carried by drum-pulleys 47 and 48, the former being secured to the driving-shaft 22 and the latter to a counter-shaft 49, which is journaled at the rear end of the frame 16. The belt 46 travels in a direction to carry the 105 splints or matches rearward, and just above the upper member of the belt are guide-strips 49^a, which are parallel with each other and which are supported on the cross-rods 50. These strips 49 are less than the length of a 110 match apart, so that when the belt 46 travels rearward the matches upon it are straightened and made to lie in parallel relation between several guide-strips 49^a. The belt 46 discharges its matches over a chute 51 into boxes 115 52, which are arranged to receive them, and the boxes 52 are carried on a cross-belt 53, which runs at right angles to the belt 46 and is arranged on a lower level, one end of the belt 53 being carried by a pulley 54 (see Fig. 120 1) and the other may be carried by a similar pulley, which is not shown, as this arrangement of the belt 53 is common to packing and straightening machines.

The means for stopping and starting the 125 pulley 54 is probably new in combination with the mechanism described below for controlling the match discharge. The pulley 54 is carried by a shaft 55, which is mounted in supports 56 and 57, the former being on the 130 frame 16 and the latter on a supplemental frame 16^a. The inner end of the shaft 55 has a beveled gear-wheel 58, meshing with a beveled gear-wheel 59 on the shaft 60, (see Fig. 1,)

and the shaft is driven by a chain belt 61, connecting with the driving-shaft 22. The pulley 54 is loose on the shaft 55, but is connected with one member 62 of a clutch, a second member 63 connecting, by means of a link 64, with the rod 65, which is arranged vertically at one side of the machine and is pivoted to the short end of the treadle-lever 66, which is fulcrumed on the frame 16^a, as shown at 67. The upper end of the rod 65 is pivoted to the lever 68, which is fast to a rock-shaft 69, and this extends transversely across the rear end of the machine-frame, as shown in Fig. 2. The rear end of the lever 68 is pivoted to a vertically-moving cross-bar 70, which moves in suitable ways in the machine-frame, and the opposite end of the cross-bar is connected by an arm 68^a with the rock-shaft 69. Each cross-bar 70 carries a gate 71, which when the cross-bar is depressed extends down into close contact with the belt 46 and abuts with the rear ends of the guide-strips 49. It will be seen, therefore, that when the boxes 52 have been filled the operator can depress the treadle-lever 66, which will cause the rod 65 to move upward, thus throwing the clutch 62 63 into engagement and starting the pulley 54, so as to advance the receptacles or boxes 52, and the same action will tilt the lever 68 and arm 68^a, so as to depress the cross-bar 70 and gate 71, and this will stop the rearward movement of matches until new boxes come beneath the chute 51, when the treadle-lever is permitted to rise, and the gate 71 is also raised, so that the matches may again move over the chute into the boxes.

From the foregoing description it will be seen that I provide a very simple means for cutting matches from a series of veneer strips and that I dispense with the mechanism usually necessary for holding and dipping the individual splints, thus cheapening the process of manufacture.

The operation of the machine will be clearly understood from the foregoing description.

It is obvious that the driving mechanism of the machine may be changed by the substitution of any usual equivalents, and that the essential thing is to provide means for feeding headed veneer strips beneath a cutter which will separate the splints from the strips, and, further, to provide means for taking care of the matches thus formed.

As before remarked, it is obvious that this process can be applied to veneer strips or to other strips of material suitable for matches where both edges of the strips are provided with the firing composition, and while I have shown in considerable detail a machine

adapted to carry out the process it will also be clearly understood that many other types of machine can be used for the same purpose, and this invention relates merely to the process and not to the means for carrying it into effect. I have shown the machine with more than usual detail in such cases, because unless the means were clearly shown it would appear to the person skilled in the art that matches could not be made in this way.

In carrying out the invention it will be found best to cut the veneer strips after the firing composition has set, but before it becomes absolutely dry—that is to say, when it has hardened sufficiently to prevent it from sticking to the knife, but before it has dried hard, is the time when it can be cut to the best advantage.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The herein-described process of making matches which consists in affixing to the outer edge of a strip of material suitable for matches so as to cover and envelop the said edge, a firing composition and then cutting the strip transversely into individual matches.

2. The herein-described process of making matches which consists in rolling a strip of material suitable for matches, separating the adjacent edges so that the headed parts cannot touch, providing the edges with a firing composition, and then cutting the strip into matches.

3. The herein-described process of making matches which consists in forming into a roll a strip of flexible material suitable for matches, rolling up with the match material a substance which will separate the edges of the said material, dipping the separated edges into the necessary compositions to form a firing composition along the said edges, and then cutting the strip of material into matches.

4. The herein-described process of making matches which consists in rolling up with a strip of veneer a belt or substance which will cause the edge portions of the strip to be separated, dipping the said separated edge portions into a firing composition, permitting the said composition to set, and then unrolling the said strip of veneer and cutting it into matches as it is unrolled.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM H. PARKER.

Witnesses:

J. H. SWETT,

W. B. HUTCHINSON.