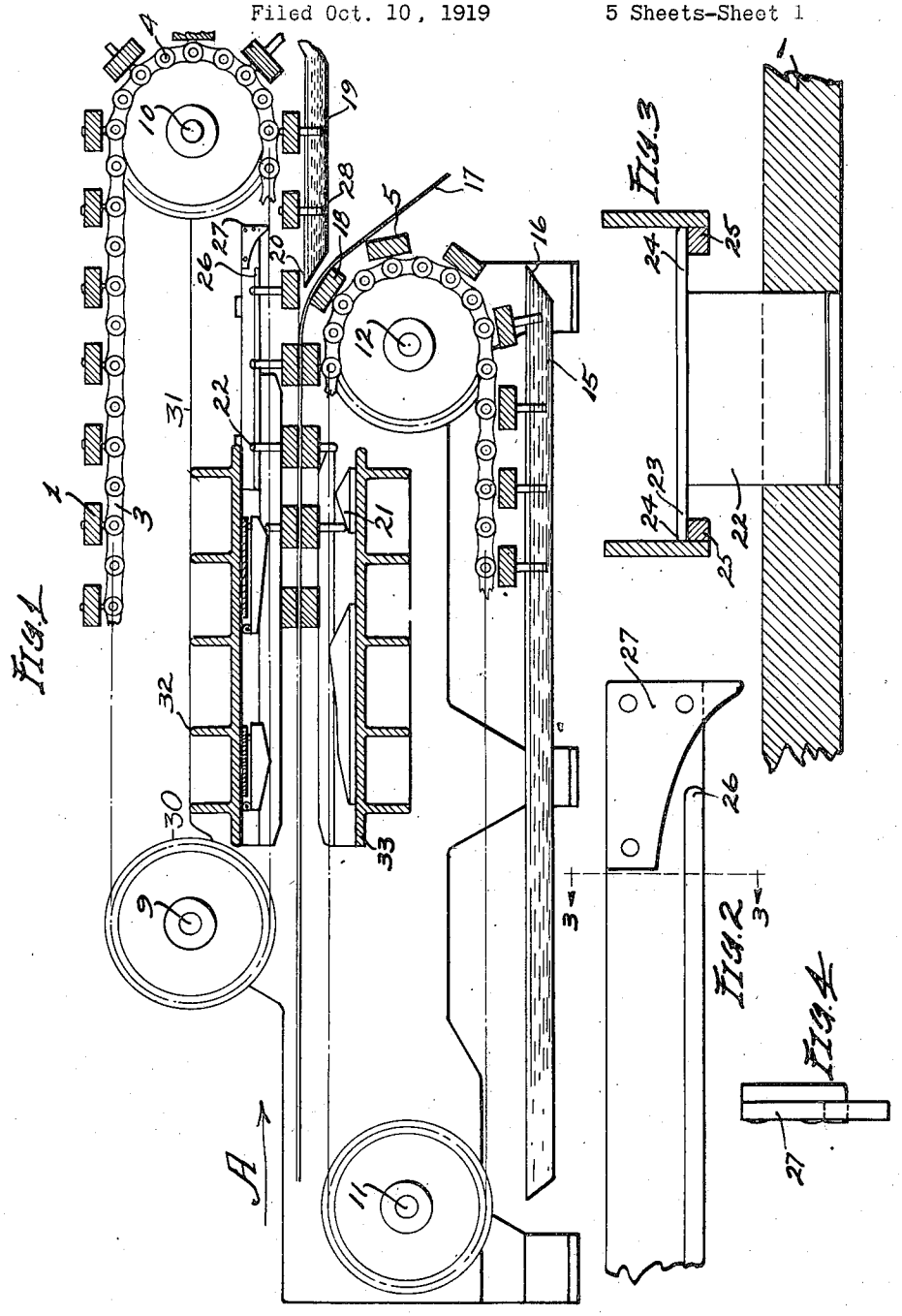
July 31, 1923. 1,463,314

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MACHINE FOR MAKING SHINGLES AND METHOD OF CLEANING AND LUBRICATING DIES

Filed Oct. 10, 1919 5 Sheets-Sheet 1



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MACHINE FOR MAKING SHINGLES AND METHOD OF CLEANING AND LUBRICATING DIES

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FIG. 5

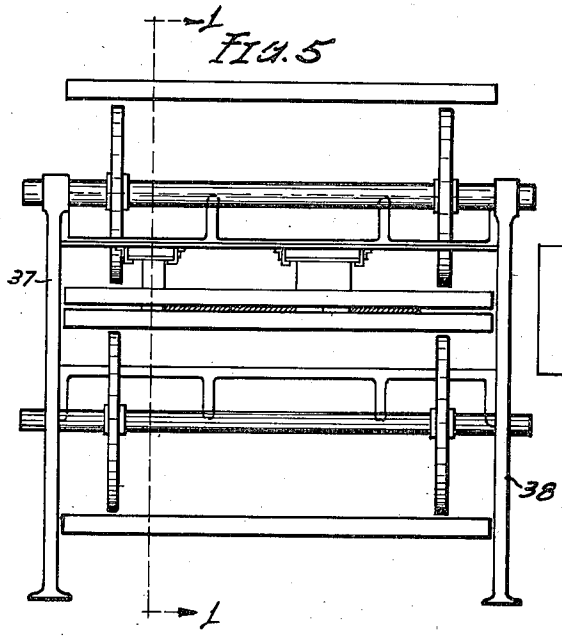
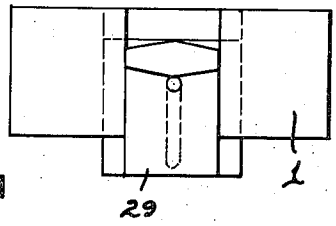


FIG. 6



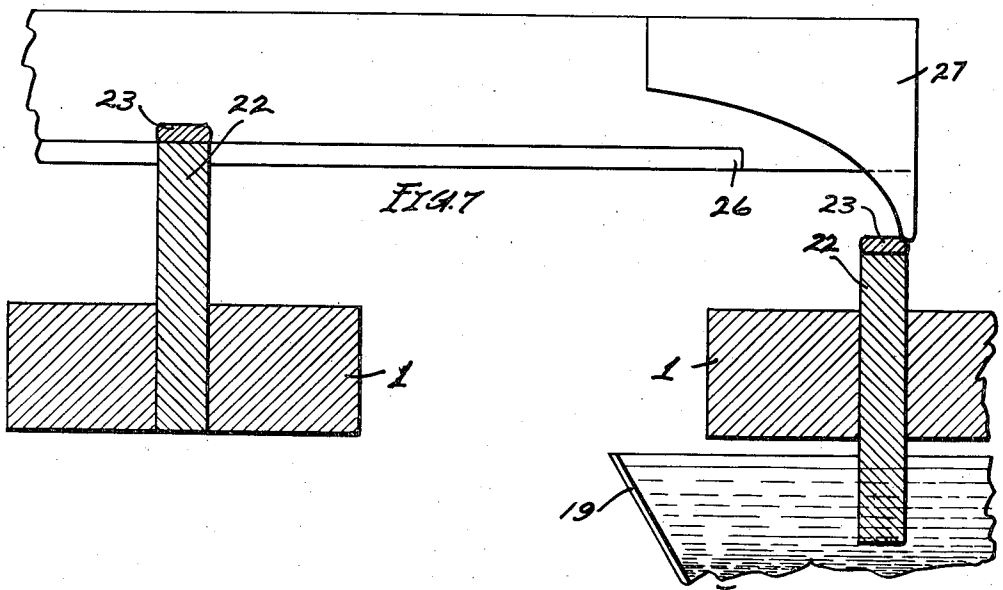


FIG. 7

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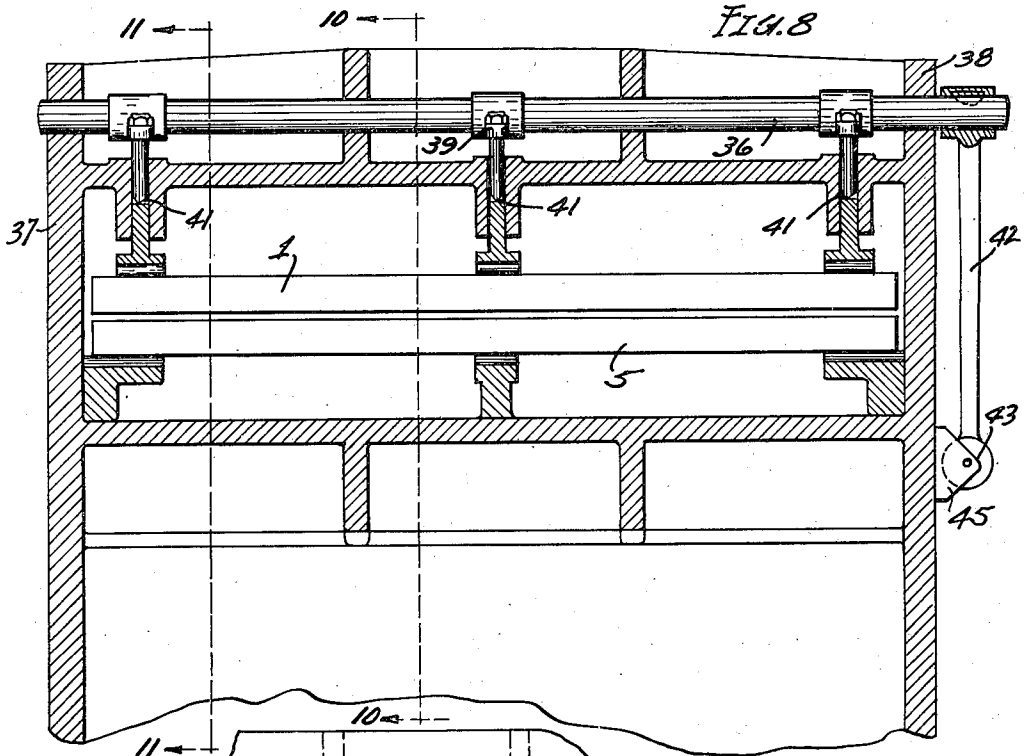
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MACHINE FOR MAKING SHINGLES AND METHOD OF CLEANING AND LUBRICATING DIES

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FIG. 8



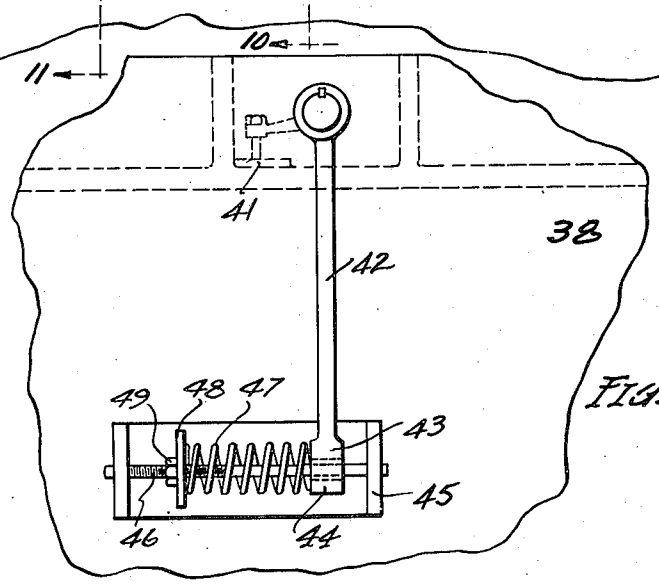


FIG. 9

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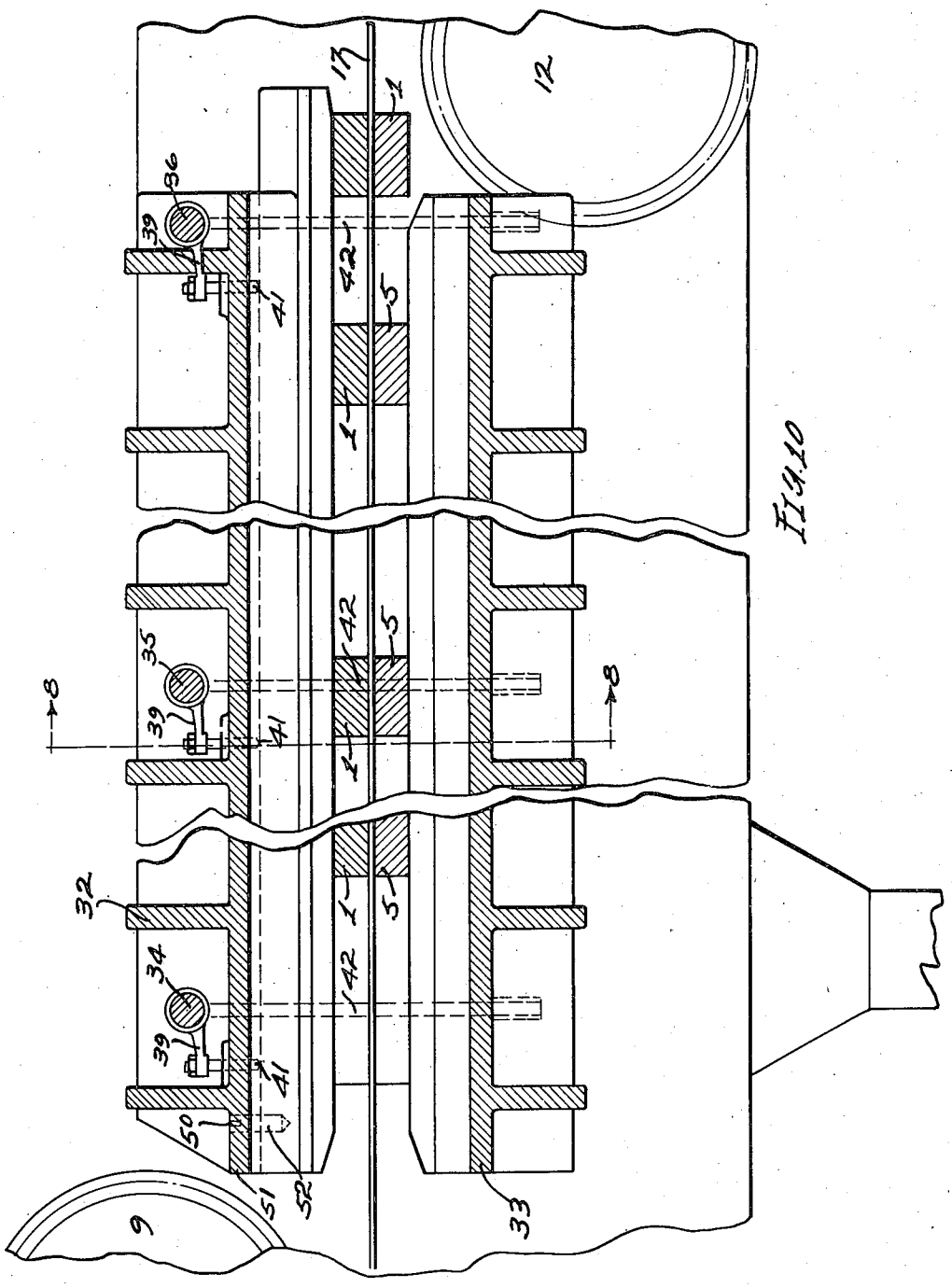


Fig. 10

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MACHINE FOR MAKING SHINGLES AND METHOD OF CLEANING AND LUBRICATING DIES

Filed Oct. 10, 1919 5 Sheets-Sheet 5

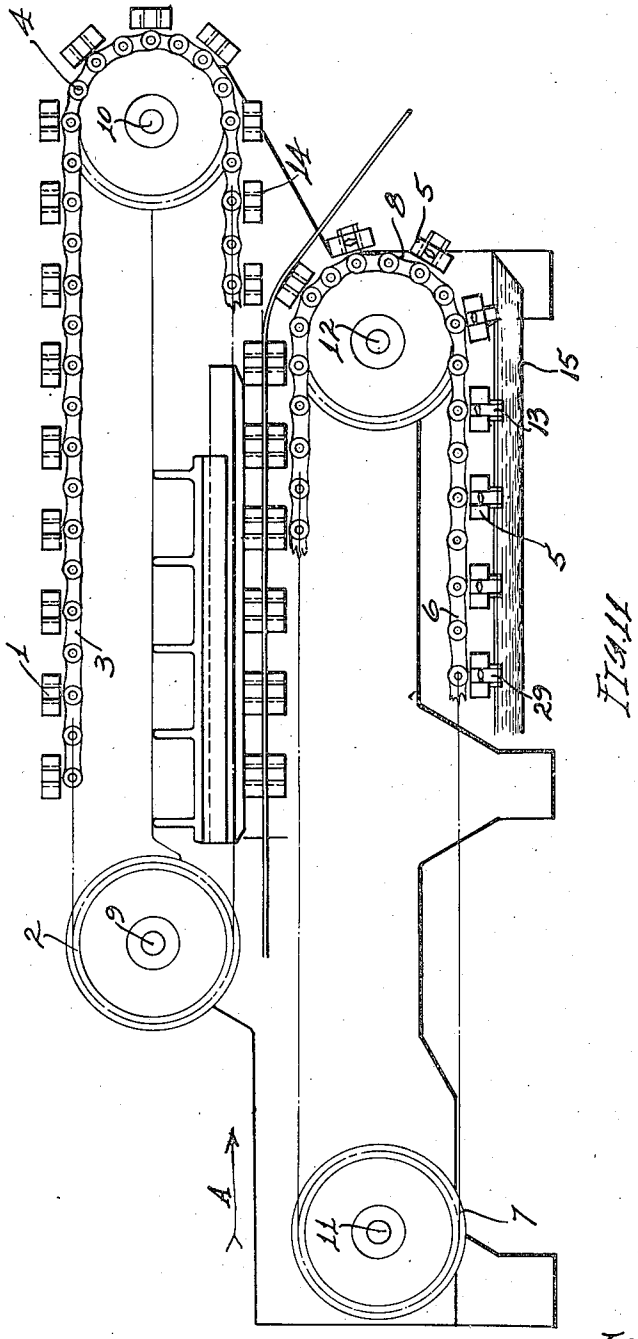


Fig. 11

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Patented July 31, 1923. 1,463,314

UNITED STATES PATENT OFFICE.

SILAS M. FORD, OF ST. PAUL, MINNESOTA.

MACHINE FOR MAKING SHINGLES AND METHOD OF CLEANING AND LUBRICATING DIES.

Application filed October 10, 1919. Serial No. 329,874.

To all whom it may concern:

Be it known that I, SILAS M. FORD, a citizen of the United States, and a resident of St. Paul, in the county of Ramsey and State of Minnesota, have invented certain new and useful Improvements in a Machine for Making Shingles and Methods of Cleaning and Lubricating Dies, of which the following is a specification.

One object of my invention is to provide in a shingle making machine improved means for actuating the dies used in blanking and the dies used in forming shingles of the style usually referred to as shingle strips, and ordinarily made of asphalt impregnated felt.

Another object is to provide in a machine of the class described means for cleaning and lubricating the dies.

Another object is to provide means for lubricating the lock bolts used in locking together co-operating die bars during the actual die operations.

Another object is to provide an improved form of spring mounted guides for the co-operating die bars.

Another object is to provide a method of cleaning and lubricating dies, the method being suitable for any type of dies, whether used in travelling die bars or stationary, in a punch press or the like.

With these and incidental objects in view, the invention consists of certain novel features of construction and combination of parts, the essential elements of which are hereinafter described with reference to the drawings which accompany and form a part of this specification.

In the drawings, Figure 1 is a section taken on the line 1—1, Figure 5; Figure 2 is an enlarged side elevation detail showing the means provided for forcibly moving the upper dies down into the cleaning and lubricating compound; Figure 3 is an enlarged cross sectional detail taken on the line 3—3, Figure 2; Figure 4 is an end view of the cam shown in Figure 2; Figure 5 is an end view of my machine; Figure 6 is an enlarged end view of one of the lower die bars, showing the locking bar in the position where it may dip into the cleaning and lubricating compound; Figure 7 is an enlarged sectional detail of the part shown in Figure 2 and showing the position of two of the dies; Figure 8 is a section taken on the line 8—8, Figure 10; Figure 9 is an enlarged side elevation detail showing the spring controlled means for holding the die bar guides; Figure 10 is an enlarged fragmentary section taken on the line 10—10, Figure 8; and Figure 11 is a section taken on the line 11—11, Figure 8.

The machine shown herein is in general similar to the one shown in my co-pending application #315,032, filed August 2, 1919, and entitled Machine for making shingles, and also discloses improvements to the machine disclosed in the application for patent of Henry Wulff, Serial Number 247,339, filed July 29, 1918, for machine and method for making shingles.

As shown in Figures 1 and 11, the paper or felt would be fed to the machine at the end A and carried through the machine in the same manner as described in the Wulff application aforesaid.

The upper series of chain carried bars 1, Figures 1 and 11, are driven by the sprockets 2 and chain 3, the chain also running over the sprockets 4.

Similarly the lower series of bars 5 carried by the chain 6 are driven by the sprockets 7, the chain passing around the sprockets 8.

The upper sprockets are mounted on shafts 9 and 10, and the lower sprockets on shafts 11 and 12, the shafts 9 and 11 being connected by suitable gears not shown, so a driving pulley keyed to the shaft 9 will drive both sets of chains at a uniform speed.

The bars 1 and 5 carry dies and knives as described in my prior application aforesaid, and also the lower bars carry lock block 13, adapted to lock into sprockets 14 in the upper bars, as also described in my application aforesaid.

I have found that when operating upon material of a tacky nature, such as asphalt impregnated felt and the like, it is necessary to clean and lubricate the male members of the dies in order to keep the machine in a continuous operating condition.

While the machine described in my prior application aforesaid performs the work of making shingles, I have determined that if the machine is to run continuously, with a minimum amount of attention, it is necessary to keep the asphalt or other similar material from adhering to the dies rather

than to attempt to clean an accumulation from the dies after a more or less indefinite period of operation.

I have accordingly provided my machine with tanks or pans in which is kept a supply of what is ordinarily known as a cutting compound which unites a certain amount of lubricating qualities with cleaning qualities so that when the male members of the dies dip into this compound the asphalt is prevented from sticking thereto, or if it sticks for a short period of time, is soon washed off and in addition the dies are kept lubricated, so the reciprocating movement of one member in the other is accomplished with a minimum amount of wear on the dies, and the material is cut and formed with a minimum amount of power, and in a uniform manner during a continuous run of the machine.

Looking at Figure 1, it will be seen that a pan 15 is positioned below the lower bars so as to allow the male die members to dip into the liquid carried in the pan.

As this pan may extend through a considerable portion of its entire length of the lower horizontal travel of the bars, the male members of the dies will always drop to their lowered position, while they are travelling horizontally from right to left, and be cleaned and lubricated.

It will be seen that the upper set of bars is offset to the right, with respect to the lower set of bars, so as to give an overhang to the upper series of bars at the right hand end of the machine, as shown in Figure 1.

A pan 19 is positioned below this overhanging end and is supplied with a compound similar to that used in the lower pan so the male members of the dies carried by the upper bars may dip into this compound and be cleaned and lubricated.

As the travel of the bars across the length of this pan is short, I find it advisable to positively force the male die members into their lower position rather than to depend upon their assuming that position by gravity.

Also it will be evident that these members must be carried in their upper retracted position until they pass beyond the lip 20 of the pan 19.

When the lower die members reach the cam 21 in their travel from left to right they are forced upwardly, thus lifting the corresponding member above.

The upper dies or knives, as the case may be, 22, and strips 23 positioned across the top thereof form projecting lips 24 and these lips are raised above the rails during their travel to the point 26.

As the lips leave the rails at 26, if the die members do not fall by gravity into their lowered position, they are forced downwardly by the two cams 27 into their lowered position shown at 28, so the die members travel a predetermined distance through the compound. (See also Figure 7.)

It will thus be seen that if the male die members in both upper and lower sets of bars must of necessity be cleaned and lubricated before they return to operative relation, one to another, in the left hand end of the machine, and as the cleaning and lubricating is done by dipping the ends of the members into the compound, the amount of lubrication is easily regulated so the bars themselves do not become covered with the compound, and hence the material worked upon is not smeared up with the compound, as would be the case were the entire bars cleaned or lubricated.

In making shingle strips using cut away dies of the shape shown at 22, Figure 7, the method described herein has a particular advantage.

As the ends of the dies have been dipped in the fluid, when the dies are actuated by their cams in punching out the strips of material so as to form the shingle tabs, the material that is punched out is lubricated by the surface of the die forced against it during the cutting operation, and when this male member of the die travels down into the female member of the die bar below, the sides of this female member of the die are lubricated and continuously kept lubricated so that the strips punched out pass freely through the die bar instead of collecting in a solid mass of piled up strips, as would be the case if the die was not lubricated.

This is an important feature in operating dies of this class on material of this nature, as it takes an enormous amount of power to force the punched out strips of the tacky material through the female member of the die unless this die member is kept continuously lubricated.

Looking at Figure 11 it will be seen that the lock blocks 29, also shown in Figure 6, are in a lowered position as they pass over the pan 16, and hence these lock blocks are also lubricated by the compound so they reciprocate freely in their co-acting sockets.

The operation of the dies is carried out between the points 30 and 31, Figure 1, and guides 32 and 33 hold the two sets of bars in their proper relation, one with the other, while the operations of the dies are carried out.

While it is necessary to hold the two sets of bars in close and substantially rigid relation with the adjacent faces forced tightly against the material that is being worked upon, I find that on account of the variation in thickness of material and other causes, that some movement should be allowed without unduly straining the machine.

Hence, instead of mounting both of the guides 32 and 33 rigidly on the frame of the machine, I mount one of them, preferably

the lower, rigidly on the frame, and support the upper guide against a novel heavy spring backing.

As shown in Figures 8, 9, and 10, three shafts, 34, 35 and 36 are journalled in the frame members 37 and 38. Keyed to each of the shafts are levers 39, and studs 40 extend downwardly from these levers and impinge on the guide 32 at 41.

Keyed to the outer end of the shafts are levers 42, extending downwardly, and having their lower ends formed into heads 43, with apertures 44 therein.

Brackets 45 mounted on the frame of the machine carry shafts 46, and springs 47 concentric with the shafts 46 abut against washers 48, whose movement to the left is limited by nuts 49, threaded or otherwise fastened to the shafts 46.

The heads 43 of the levers 42 are concentricly mounted with the shafts 46, the shafts extending through the apertures of the heads, so the compression of the springs 47 tend to rotate the levers 42 in a counter-clockwise direction, and hence the studs 41 are pressed downwardly against the guide 32.

By this arrangement I secure a heavy downward pressure on the guide 32, and yet the guide is so mounted that it may be lifted slightly if sufficient upward pressure is created, or either end may lift independently of the other, so that paper of more than the standard thickness may pass through the machine without doing any damage to the mechanism.

Bolt 50 extends downwardly from the guide guard 51 into an aperture 52 of the guide 32, to prevent longitudinal movement of the guide under influence of the travelling bars and yet allow a slight vertical or tipping movement to the guide under excessive pressure.

While I have described my invention and illustrated it in one particular design, I do not wish it understood that I limit myself to this construction, as it is evident that the application of the invention may be varied in many ways within the scope of the following claims:

Claims:

1. In a machine for making shingles through the operation of dies carried in travelling die bars, the combination with a frame, of multiple die bars, a stationary guide for said die bars carried by the frame, and a spring mounted guide for said die bars likewise carried by said frame for holding said die bars firmly against the material to be operated upon, while passing between said guides and means for causing said die bars to travel with respect to said guides.

2. In a machine for making shingles the combination with the frame of the machine, of multiple die bars, means for causing said die bars to travel along said machine, means for operating dies carried by said die bars, a guide extending along said machine to support said die bars while said dies are actuated, a bell crank rotatably mounted in the frame of said machine and having one end impinging on said guide, and spring means associated with the other end of said bell crank for creating pressure between said first named bell crank end and said guide.

3. In a machine for making shingles the combination with multiple travelling die bars, of a frame, a guide for positively positioning said die bars and causing said die bars to move in a straight line throughout a portion of their travel, and two spring pressure means connecting said guide with the frame of the machine for pressing said guide against said die bars, yet allowing said guide to rock or lift under abnormal pressure and means for causing said die bars to travel with respect to said frame.

4. In a machine for making shingles the combination of a frame, endless travelling means, slidable dies carried by said travelling means, a pan positioned so that said travelling means will pass thereover, and means for dipping a portion of said dies into fluid carried by said pan.

5. In a machine for making shingles the combination of a frame, endless travelling means mounted in said frame, slidable dies carried by said travelling means, means for retracting said slidable dies, means for forcing said slidable dies to an extended position, and a pan so positioned that said dies will dip into the fluid contained therein when passing thereover in their extended position.

6. In a machine for making shingles the combination of a frame, two endless travelling means mounted in said frame, co-operating die bars carried by said travelling means, means for locking co-operating bars together during a portion of their travel, said locking means travelling in an extended position during a portion of their travel, and a pan so positioned as to allow said locking means to dip therein when extended, so as to be lubricated by fluid carried by said pan.

7. The method of operating dies comprising the carrying of said dies on endless travelling means, feeding material to said dies, actuating said dies to work on said material, lifting said dies from said material, carrying said dies in their lifted position and then causing said dies to dip into a fluid.

8. The method of operating dies comprising the carrying of said dies on endless travelling means, feeding material to said dies, actuating said dies to work on said material, and then causing said dies to dip into a fluid and after being withdrawn from said fluid return to a position to repeat the cycle of operations.

9. The method of operating dies including a male and a female member, comprising the carrying of a die on endless travelling means, lubricating the operating end of said male member, feeding material to said die, actuating said die to work on said material, whereby said material worked upon is lubricated.

10. The method of operating dies including a male and a female member, comprising the carrying of a die on endless travelling means, lubricating the operating end of said male member, feeding material to said die, actuating said die to work on said material, whereby said material worked upon is lubricated, and the side walls of the female member are lubricated by the entrance therein of the lubricated male member.

11. The method of operating dies, including a male and a female member, comprising the feeding of material to a die and the lubricating of the operating end of the male member of said die prior to each operation on material fed thereto, whereby the female member of the die may be lubricated by the lubrication from the male member of the die.

SILAS M. FORD.