

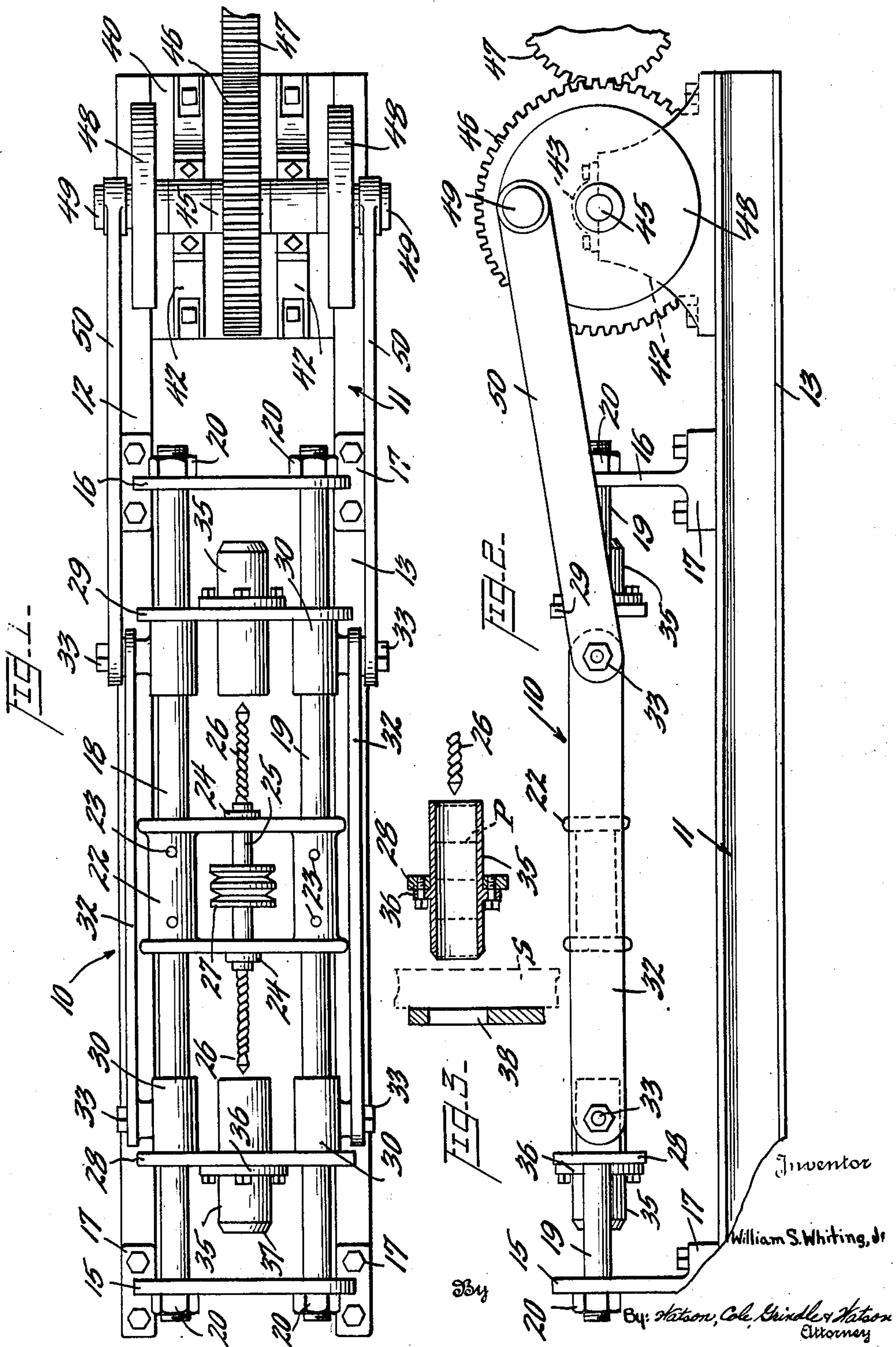
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WOODWORKING MACHINE

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WOODWORKING MACHINE

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This invention relates to woodworking apparatus and more particularly to machines for cutting wooden blocks from pieces of stock and boring them to provide articles of manufacture such as, for example, spools, bobbins, paper-roll blocks, or the like.

The general object of the invention is to provide a novel and improved machine of the class described which is adapted to perform a plurality of operations on the stock in producing the desired perforated article. The machine is substantially automatic in operation and requires a minimum of supervision in turning out the product in quantity. It is also of simple construction and easy and economical to install, operate, and maintain.

In its preferred embodiment, the invention contemplates the provision of a fixed abutment or anvil and a rotary drill carried by a fixed support and spaced from said abutment. Between these members a tubular punch element is mounted for reciprocation. For most purposes the punch will be of a circular configuration but obviously it may be oval, polygonal, or any other shape within the scope of the invention. One end of the tubular punch element is provided with a sharpened annular cutting edge and the opposite end is unobstructed and is disposed coaxially with the drill so that the latter may penetrate the punch element to a considerable extent during the oscillation or reciprocating movement of the punch in one direction. During its movement in the other direction, the punch element is adapted to cut or punch out a plug or blank from a piece of stock held against the abutment or anvil. The plug will be frictionally retained within the tubular punch member so that it will be presented to the drill during its return movement. The punch member may be of a length equal to that of one or more of the plugs and upon successive punching strokes the plugs will move along the punch element and will be discharged from the rear end of the punch one by one.

Another of the objects of the invention is the provision of a double drill support fixed near the center of the machine with the rotary drills facing outwardly in opposite directions. Abutment or anvil members are provided at spaced points from each of the drills and two punch members are connected for simultaneous movement, one disposed between each drill and abutment set. With this arrangement it will be readily understood that when one of the punch members is moving to cut out a plug from the stock against

its associated abutment, the other punch member will bring a previously cut plug against its drill to bore it out. In this way a completed plug will be delivered during each stroke of the machine in both directions.

Other objects and features of novelty will be apparent from the following specification when read in connection with the accompanying drawing in which one embodiment of the invention is illustrated by way of example.

In the drawing:

Figure 1 is a plan view of a machine embodying the principles of the invention;

Figure 2 is a view of the machine in side elevation; and

Figure 3 is a fragmentary view in vertical section of a portion of the machine showing the punch, the drill, and the abutment at one side thereof.

In the illustrated embodiment, the machine indicated generally by the reference numeral 10 is mounted on a base 11 which may comprise two spaced rails 12 and 13. Bridging these rails at spaced points along the machine are the abutment plates or anvil members 15 and 16. These plates may be secured to the rails 12 and 13 as by means of bolting the pedestals or feet 17 thereto. The plates 15 and 16 are disposed transversely of the machine and are connected together by means of the parallel spaced bars 18 and 19. These bars may be secured to the plates by means of the nuts 20. At a central point between the plates 15 and 16 a drill support 22 is secured to the bars 18 and 19 as by means of the pins 23. The member 22 extends across the machine and is provided with bearings 24 for the rotary spindle 25 which carries upon each of its ends a drill 26. Pulleys 27 are secured centrally of the spindle 25 and may be driven from any source of power by means of a belt or chain.

Slidably mounted upon the guide bars 18 and 19 between the drill support 22 and the respective anvil plates 15 and 16 are the cross heads 28 and 29. These cross heads comprise the sleeve portions 30 which fit the rods 18 and 19 and slide thereon and the cross heads are rigidly connected together for simultaneous movement along the bars by means of the side plates 32 which may be bolted to the sleeves as at 33. Each of the cross heads 28 and 29 are provided with central openings into which are fixed the punch elements 35. The elements 35 are tubular and may be of any suitable cross sectional configuration, although punches of circular shape are illustrated in the drawing and will be the most frequently em-

played. Each punch member 35 is provided with an annular flange 36 by means of which it is bolted to the cross heads. The forward annular end of each punch is beveled to provide a sharp cutting edge 37. Each abutment plate or anvil 15 and 16 is preferably provided with a central opening 38 into which the cutting edge 37 of the punch may enter as it completes the serving of a plug or blank P from the stock indicated at S in Figure 3 of the drawing.

Driving means for the device are mounted at one end of the machine for example on the plate 40 which forms a part of the base 11. Pillow blocks 42 are bolted to the base plate 40 and are provided with bearing grooves and bearing caps 43 for the drive shaft 45. This drive shaft carries a gear wheel 46 at its central point which meshes with a driving gear 47 which may be rotated by any suitable source of power. Upon each end of the drive shaft 45 there is mounted a crank disc 48 carrying a crank pin 49 which is connected by means of the pitman 50 with the nearest bolt or pin 33 carried by the cross head 29.

The operation of the device will be readily apparent. Pieces of suitable stock are held against the faces of the anvils or abutment plates 15 and 16, preferably with the grain extending in the same general direction as the axis of the machine. The machine is set in operation and the cross heads 28 and 29 reciprocate upon the slide rods 18 and 19. One of the punches 35 severs a plug from the stock which plug is frictionally held within the tubular punch element during its return movement. During this same return movement the other punch element cuts a plug from the stock against its anvil. Upon successive punching movements the plugs will accumulate within the interior of the punch elements and will be carried toward the drills 26 which will rotate by means of the pulleys 27. The plugs indicated at P in Figure 3 will be brought against the drills and will be bored out during each non-punching stroke. The accumulated plugs will then fall out of the punch members one by one upon successive punching strokes and may be caught in a suitable receptacle beneath the machine. Finally, if necessary or desirable for the particular work at hand, the plugs or other such articles may be thoroughly dried and turned down in a lathe.

It will be seen that by means of the present invention, I have provided novel and improved means for rapidly punching and drilling articles such as spools or paper-roll plugs. One skilled in the art will also readily perceive that the plugs may be cut from irregular pieces of stock of varying diameters and which cannot be used on the conventional plug or spool machines. It is to be noted that there is no more power required to punch a plug from a large piece of stock than from a small one. Also knots occurring in the stock may be readily sheared off, whereas these cause much difficulty in using any kind of rotary cutting machine or lathe. Furthermore, the punch will cut many times as many plugs as any other known cutter without being resharpened.

Although the machine has been illustrated and described as being in a horizontal position, it may be inclined or disposed vertically if desired; and it will be understood that various changes and modifications can be made in the illustrated and described embodiment without departing from the scope of the invention as defined in the following claims.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. A woodworking device comprising, in combination, a supporting frame, a stock supporting member on said frame, a support on said frame at a predetermined distance from said member, boring means on said support extending toward said member, a carriage mounted on said frame for reciprocation between said member and said boring means, an open ended annular punch and work gripping means on said carriage, whereby a blank may be punched from a piece of stock at said member at the end of one stroke of said carriage, said blank being retained in said annular punch and work gripping means and forced to its opposite end by successively punched blanks to be presented to said boring means during an opposite stroke of said carriage, and the further operation of said device in punching blanks acting to force said blank from said gripping means during a subsequent stroke toward said member.

2. A woodworking device comprising, in combination, a supporting frame, an anvil member at one end of the frame, a support fixed to said frame at a predetermined distance from said anvil member, a rotating drill mounted on said support, a carriage slidably mounted on said frame for reciprocation between said anvil member and said drill, a tubular punch member having sharpened forward edges carried by said carriage, said sharpened edge being directed toward said anvil member, whereby upon movement in one direction the punch cuts a blank from a piece of stock held against said anvil member, the blank lodging frictionally within the tubular punch member, and upon movement of the carriage in the opposite direction the retained blank is presented to the drill for boring, the finished blanks being discharged from the rear end of the tubular punch member upon succeeding punching strokes.

3. A woodworking device comprising, in combination, a supporting frame, an anvil member at each remote end of the frame, a single support fixed to said frame at a central point thereon, a rotatable shaft on said support, two rotating drills each rigid with one end of said shaft and facing in the opposite direction from the other and toward one of said anvil members, unitary means for rotating said shaft, a unitary carriage slidably mounted on said frame, straddling said drill support, and having parts disposed for reciprocation between said anvil members and said drills, a tubular punch member having sharpened forward edges carried by each part of said carriage, said sharpened edges being directed outwardly toward said anvil members, whereby upon movement in one direction one of the punches cuts a blank from a piece of stock held against one of said anvil members, the blank lodging frictionally within the tubular punch member, and upon movement of the carriage in the opposite direction the retained blank is presented to the corresponding drill for boring and the punch on the opposite side of the member cuts its blank and retains it for presentation to the drill on the next movement in said one direction, the finished blanks being discharged from the ends of the tubular punch members opposite the sharpened edges thereof upon succeeding punching movements, whereby upon each movement of the punch member in either direction one punching operation and one drilling operation is performed and one blank is completed and discharged.

4. In a woodworking device, a frame, a support on said frame, a drill on said support, a hollow cylindrical punch member slidably mounted on said frame for movement to and from a drill, a sharpened cutting rim at one end of said cylindrical punch member, the opposite or rear end of said member being open and unobstructed and facing the drill, and means for reciprocating said punch member on said frame to punch an article from a piece of stock upon movement in one direction, frictionally retain it within the hollow interior and then present it through said open rear end to the drill for boring upon movement in the opposite direction.

5. In a woodworking device, a frame, a stationary support on said frame, a drill on said support, a hollow cylindrical punch member on said frame for movement to and from a drill, a sharpened cutting rim at one end of said cylindrical punch member, the opposite or rear end of said member being open and unobstructed and facing the drill, and means for reciprocating said punch member on said frame to cause said cutting rim to punch an article from a piece of stock upon movement in one direction, and withdraw the punched article upon movement in the oppo-

site direction, said reciprocating means providing relative movement between said punch member and said drill support, whereby the blank may be presented to the drill for boring adjacent the said open rear end of said punch member upon said movement in the opposite direction.

6. A woodworking device comprising, in combination, a supporting frame, a stationary stock supporting member on said frame, a stationary support on said frame at a predetermined distance from said member, boring means on said support extending toward said member, a carriage mounted on said frame for reciprocation between said member and said boring means, an annular punch and work gripping means on said carriage, whereby a blank may be cut from a piece of stock at said member at the end of one stroke of said carriage, said blank being retained by said punch and work gripping means and presented to said boring means during an opposite stroke, the construction and arrangement being such that a piece of work is released from said punch and work gripping means during a subsequent stroke toward said member.

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