July 14, 1931. H. N. WEIR 1,814,879

JORDAN ENGINE PLUG

Filed Aug. 26, 1929

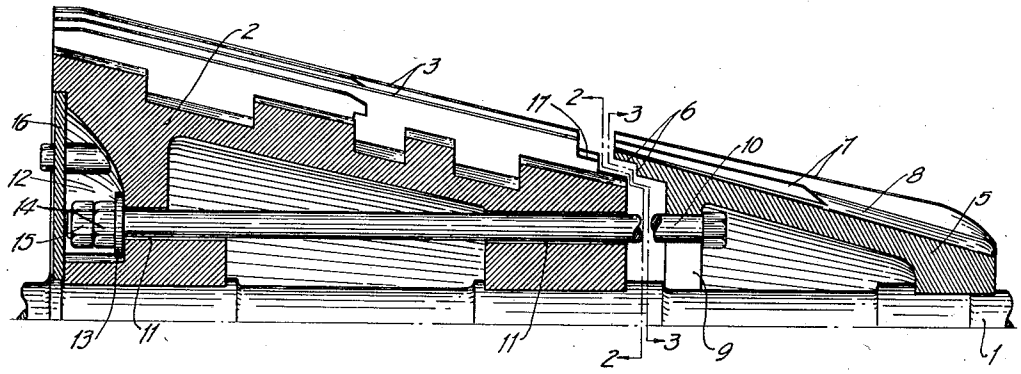


FIG. 1

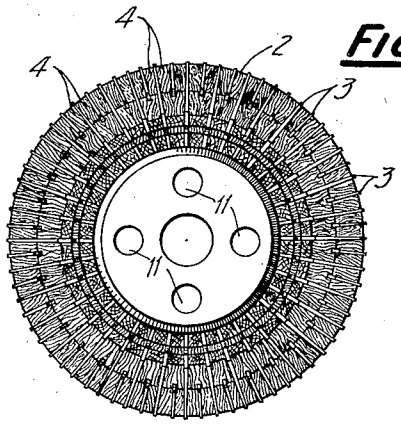


FIG. 2

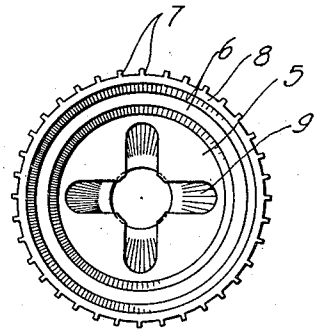


FIG. 3

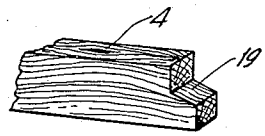


FIG. 5

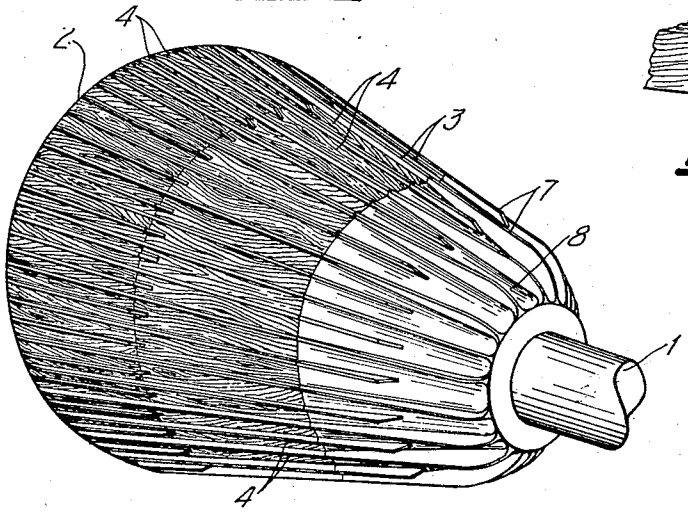


FIG. 4

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UNITED STATES PATENT OFFICE

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JORDAN ENGINE PLUG

Application filed August 26, 1929. Serial No. 388,426.

My invention relates to paper making machinery are particularly to improvements in the construction of jordans, refining engines and the like.

Machines of this character comprise a tapered shell provided on the interior with fixed cutting elements, and a cone or plug having cutting elements or blades on the surface thereof, and which is axially mounted to rotate within the shell. Material to be treated is introduced into the smaller end of the device and is carried forward to the larger end and discharged therefrom by centrifugal force.

Many grades of stock which are introduced into the machines contain considerable foreign matter such as bits of wire, staples, paper clips and other hard particles which are ultimately reduced by passage between the cutting elements. However, these hard particles, being swept between the stationary and revolving knives, cause a great deal of wear on the device, particularly the smaller end of the plug where the material is introduced and eventually cause the bars to become loosened and broken. In many cases the entire set of knives and wedges must be replaced.

Even when the better grades of stock are used, the large amount of water passing through the jordan eventually causes the wood in the wedges to warp, rise at the end, and be destroyed, and the blades loosened.

My invention relates to a cast conical section having knives integral therewith to form the front section of the plug. This section is fastened to the plug shaft by any suitable means, and has a notched flange that fits over the movable knives and wedges thereby acting as an additional holding or locking means. This flange also acts as a shield to protect the ends of the knives and wedges.

The section is preferably secured to the main body of the plug by long bolts extending parallel to the shaft, and ending in a recess in the plug body. The bolts are threaded where they pass into the recess and are held by nuts and lock nuts. The recess is covered to protect the nuts from being washed and destroyed.

From the above, it will be seen that I provide a cast renewable section of hardened material. The knives thereon will receive the brunt of the wear because they are first exposed to the inflowing stock and the section will serve generally to protect the ends of the knives and wedges of the plug proper

My invention, therefore, includes the novel elements and the combinations and arrangements of elements described below and illustrated in the accompanying drawings, in which—

Fig. 1 is a longitudinal axial section of a half jordan plug, with wedges omitted, showing the renewable section moved out of contact with the plug;

Fig. 2 is a fragmentary view of the jordan plug taken from position indicated by lines 2—2 in Fig. 1;

Fig. 3 is a fragmentary view of the renewable section taken from position indicated by lines 3—3 in Fig. 1;

Fig. 4 is a perspective view of a jordan plug with my renewable section attached; and

Fig. 5 is a fragmentary perspective view of a wedge.

Referring to the drawings, 1 represents the usual shaft to which the main body, 2, of the plug is keyed or otherwise secured. Attached to the plug, 2, are the bars of knives, 3, which are secured in place by wedges, 4. The bars, 3, and wedges, 4, at the smaller end of the plug are notched, as shown at 17 in Fig. 1, and 19 in Fig. 5, respectively, adapting these elements to fit beneath and be retained by the flanges, 6, of the removable section as hereinafter described.

My removable section is shown generally at 5. It is conical shaped and has a notched flange, 6, which is adapted to fit over the notched ends of knives, 3, and wedges, 4, when drawn into close contact with plug, 2. This section is preferably made of cast manganese steel but it may be constructed of any suitable material that is hard, tough and durable. Cast integral or forming an integral part of the section are blades or

knives, 7. These blades are so disposed around the periphery of section, 5, that they will align with the bars, 3, of plug, 2, when section, 5, is secured to the plug. The outside and working edges of the blades may be machine ground to a true conical surface. The metal filling, 8, between knives, 6, is so cast that it will be substantially flush with the tops of wedges, 4, when the section is attached to the plug.

Section, 5, is provided with radial slots, 9, as shown, into which bolts, 10, are placed. These bolts pass through cylindrical holes, 11, in the plug and which are parallel to shaft, 1. These bolts, 10, terminate in a recess, 12, at the larger end of the plug and are threaded to receive nuts, 14, and lock nuts, 15. Covering this recess, 12, is plate, 16, secured to the plug by any suitable means.

When section, 5, is secured to plug, 2, the notched flange, 6, overlies and holds in place both the wedges, 4, and the blades, 3, by bearing against shoulders formed by notches, 17 and 19.

From the foregoing, it will be apparent that any hard material which enters the device will first come into contact with the blades or bars on the removable section, 5, and, since these bars extend for a rather substantial distance axially along the surface of the plug, such material will be practically reduced before reaching the blades and wedges in the main body of the plug. Thus the brunt of the wear to which the plug is subjected will be sustained by the hard cast section. When this wear becomes excessive the end section may be easily removed and replaced by simply removing the bolts, 11.

While I have described my invention in its preferred embodiment it is to be understood that the words which I have used are words of description rather than of limitation and that the drawings are merely illustrative. Hence changes, within the purview of the appended claims, may be made without departing from the true scope and spirit of my invention.

What I claim is—

1. The combination with a jordan plug, of a metal sleeve, having integral knives, fitting over and forming the smaller end of the plug.

2. The combination with a jordan plug having removable knives and wedges, of a metal section having integral knives thereon and fitting over the ends of said wedges at the smaller end of said plug; whereby said wedges are secured in place.

3. The combination with a jordan plug having removable knives and wedges, of a metal section having integral knives thereon and fitting over the ends of said knives at the smaller end of said plug; whereby said knives are secured in place.

4. The combination with a jordan plug having removable knives and wedges, of a metal section having integral knives thereon and fitting over the ends of said knives and wedges at the smaller end of said plug, whereby said knives and wedges are secured in place.

5. The combination with a jordan plug, keyed to a shaft, of a cast metal conical section, with knives integral therewith, having a tapered, recessed flange closely embracing the end of said plug.

6. The combination with a jordan plug having knives and wedges, of a metal section having knives cast integral therewith, and forming the front end of said plug; said section having an annular recessed flange fitting over the front end of the plug and protecting the ends of the knives and wedges of said plug.

7. The combination with a jordan plug, keyed to a shaft and provided with axially extending passages therein leading to a recess at the back of the plug, of a cast metal sleeve having integral blades, and forming the front end of the plug; said sleeve being attached to the plug by threaded elements extending through said passages and secured by nuts in said recess.

8. The combination with a jordan plug, having knives notched at the small end of the plug, of a conical metal section having integral knives and closely embracing the end of said plug, and the notched ends of said knives; the knives in said plug and section being disposed in aligned relation.

9. In a jordan plug including knives and wedges, a removable section forming the smaller end of said plug and comprising a conical casting having a plurality of knives integral therewith and located on the surface thereof and having an annular recess at the larger end adapting it to fit over and secure in place the ends of said knives and wedges.

10. In a jordan plug including knives and wedges, a removable section forming the smaller end of said plug and comprising a conical casting having a plurality of knives integral therewith and located on the surface thereof and adapted to align with the knives of said plug and having an annular recess at the larger end adapting it to fit over and secure in place the ends of said knives and wedges.

11. In a jordan plug including notched knives and wedges, a removable section forming the small end of said plug and comprising a conical casting having a plurality of knives integral therewith and located on the surface thereof and having an annular recess at the larger end adapting it to fit over and secure in place the notched ends of said knives and wedges.

HARRY N. WEIR.