April 19, 1932. L. H. WESSEL ET AL 1,854,356

MACHINE FOR REFINING PAPER AND PULP

Filed May 17, 1927 2 Sheets-Sheet 1

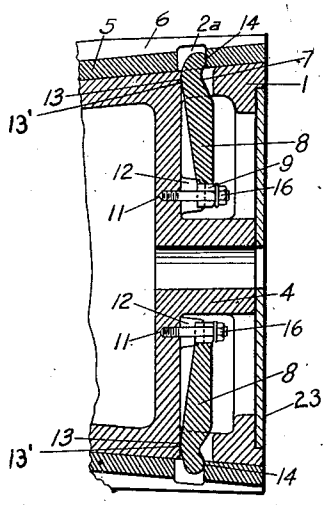


Fig. 1

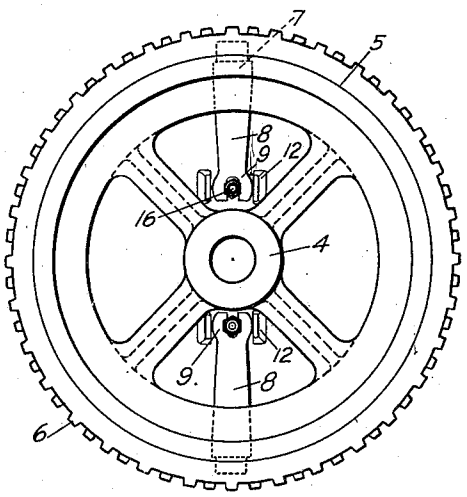


Fig. 2

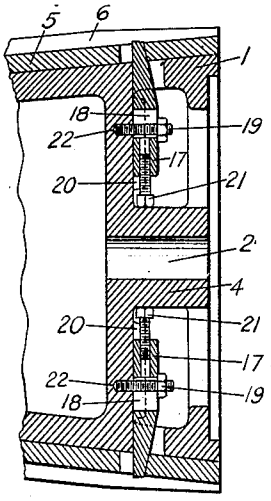


Fig. 3

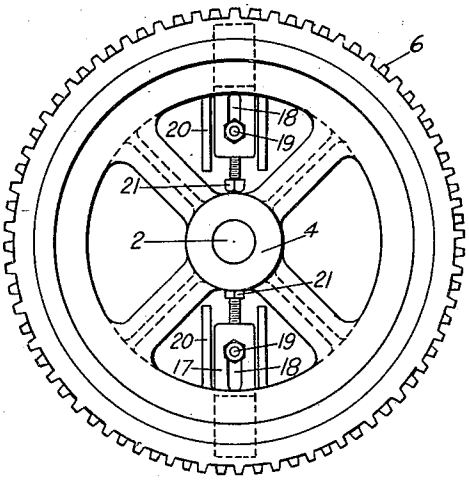


Fig. 4

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MACHINE FOR REFINING PAPER AND PULP

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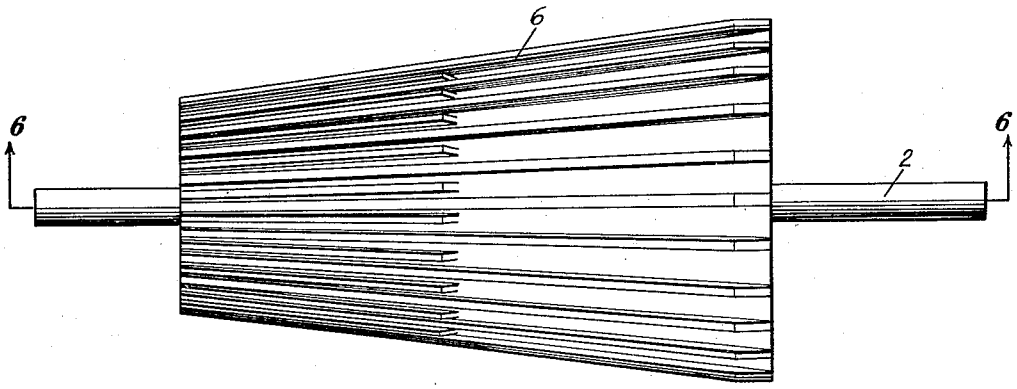


Fig. 5

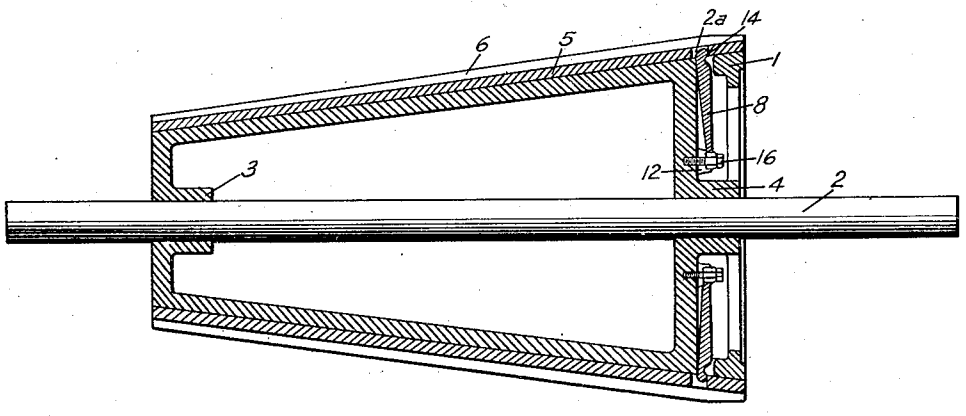


Fig. 6

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UNITED STATES PATENT OFFICE

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MACHINE FOR REFINING PAPER AND PULP

Application filed May 17, 1927. Serial No. 192,115.

Our invention relates to a machine for refining paper and pulp and relates, more particularly, to a means for properly positioning and rigidly securing various parts of the refining plug in operative relation.

Plugs of this character are commonly known as Jordan plugs and are provided with beating and brushing knives carried by a sleeve. Such sleeves are, generally, wedge-shaped conforming to the shape of the plug on which they are disposed to form an effective driving connection and these sleeves are, necessarily, removed from time to time in order that repairs or replacements may be made. It is, therefore, a requirement that some means be provided whereby the sleeve may be properly positioned and rigidly secured to the plug body and, at the same time, will facilitate the removal of the sleeve from the plug body. Previous means provided for properly positioning and securing the sleeve to the plug have been unsatisfactory from the standpoint that the positioning and securing means have contacted with a large amount of water which, in time, destroys their efficiency. Also, the length of time required to remove and replace this sleeve on the plug body and consequent delay in production has been an undesirable feature.

One object of our invention is to provide a device wherein the various parts of the refining plug may be positioned and secured in operative relation, forming an effective driving connection and, at the same time, providing a device wherein the sleeve may be quickly and easily removed from the plug body.

Another object of our invention is to provide a device wherein the positioning and securing means may be protected from contact with water or other fluids which tend to destroy its efficiency.

Other and further objects of our invention will be apparent as this description progresses and the preferred embodiment of our invention will be seen in the accompanying drawings wherein similar characters of reference designate corresponding parts and wherein:

Figure 1 is a sectional view of the large end of a refining plug showing the means for properly positioning and securing the various parts of the plug in operative relation.

Figure 2 is an end view of the device shown in Figure 1.

Figure 3 is a view similar to Figure 1 but showing a modification in the means for properly positioning and securing the various parts of the refining plug in operative relation.

Figure 4 is an end view of the modification shown in Figure 3.

Figure 5 is a side elevation of a refining plug and its covering sleeve positioned and secured in assembled relation in accordance with the preferred embodiment of our invention.

Figure 6 is a sectional view of the device shown in Figure 5 and taken on the line 6—6 of Figure 5.

With reference to the drawings, we have shown a refining plug constructed in accordance with our invention wherein the numeral 1 designates a tapered hollow plug of circular cross-section. This plug is mounted upon a shaft 2 by means of the bearings 3 and 4 or in any other manner suiting the preference of the user. The plug 1 tapers toward one end so that it is substantially conical in form and may be wedged tightly into a covering sleeve 5. Such sleeve 5 is provided on its exterior surface with ribs 6 or the like to form a suitable refining means. Any suitable type of refining means may be used and we do not want to be limited to any particular type of refining plug or any method of mounting this plug on its shaft.

The large end of the plug body 1 is equipped with the circumferentially spaced slots 7 which are adapted to receive the ends of the oppositely extending radial arms 8. These arms 8 extend through the slots 7 to engage the circumferentially spaced grooves 2*a* in the large end of the plug liner 5. The slots 7 and the grooves 2*a* are only slightly larger than the ends of the arms 8 to facilitate the insertion of the ends of the arms 8 therein but prevent any circumferential creeping of the plug liner 5 around the plug body 1. The arms 8 are bifurcated as at 9 to

receive the bolts 10 which are threaded into the plug body 1 as at 11 and any tendency toward movement by the bifurcated end of the arm 8 is prevented by the lugs 12 on each side thereof. The arms 8 contact with the plug body 1 as at 13 and with the sleeve 5 as at 14. These arms are so constructed, as regards shape, as to form a fulcrum at 13′ or the point of the contact with the plug body 1. By referring to the drawings, it will be easily seen that, when the nut 16 on the bolt 10 is tightened, the bifurcated end of the arm 8 will be drawn in the direction of the small end of the plug body and, the arm 8 being fulcrumed as at 13′, the opposite end of the arm that contacts with the sleeve 5 will be forced away from the small end of the plug body, thus tightening the sleeve on the plug body 1.

It will be understood that, although this positioning and securing means has been described as applying specifically to a plug liner, such positioning and securing means may be used on many different linings, particularly those held in operative relation with their supporting means by a wedging action.

By referring to Figures 3 and 4 of the drawings, it will be seen that the modification of our invention consists in providing an arm 17 which secures the plug 1 and the sleeve 5 in operative relation by a wedging action. These arms 17 are slotted as at 18 to receive the bolts 19, threaded onto the plug body as at 22, and give the arms 17 the sufficient longitudinal movement required to move the small ends of the arms out of operative relation with slots in the sleeve 5. Guides 20 are provided on each side of the arms 17 to prevent circumferential creeping of the sleeve with relation to the plug body 1 and the bolts 21 are threaded into the opposite ends of the arms 17 for the purpose of forcing the small end of each arm 17 longitudinally into operative relation with the sleeve 5. The heads of the bolts 21 rest against the outer circumference of the bearing 4 and it will be clearly seen, by reference to Figure 4 of the drawings, that any turning of the bolts 21 will move the small end of the arms 17 either into or out of operative relation with the sleeve 5.

A covering 23 may be provided to interfit with and be attached to the large end of the plug body 1 to protect the bolts and other working parts of the positioning and securing means from contacting with water and other fluids which might, in any way, destroy the efficiency of the positioning and securing means. It is a well-known fact that some paper will lodge in the large end of the refining plug and, thus, necessitating a thorough cleaning of the plug each time the color of the paper is changed to prevent mixtures in the color of the paper. By covering the large end of the plug with such a plate, this danger is easily eliminated.

By referring to the previous description and the drawings attached hereto, it will be easily seen that we have provided a device of such construction that a very simple, yet reliable and inexpensive, means for positioning and securing the sleeve in operative relation with the refining plug is obtained. It will also be clear that we have provided means for preventing the circumferential creeping as well as the endwise play of the sleeve. Furthermore, by reference to the preceding description, it will be seen that our device is so constructed that it will not interfere in case it is desired to attach a plate or other covering to the large end of the plug body. The threads of the bolts and other working parts of the positioning and securing device may, in this way, be protected against the destructive action of water or other fluids with which they would otherwise come in contact.

Having thus described our invention, what we claim is:

1. A sleeve supporting device comprising a plug, a sleeve mounted on said plug, and means for securing said sleeve and said plug together, said means being mounted within the interior of said plug and projecting through the walls of said plug and into the walls of said sleeve.

2. A sleeve supporting device comprising a plug, a sleeve mounted on said plug, means for securing said sleeve and said plug together, said means being mounted within the interior of said plug, and means for excluding liquid from the interior of said plug.

3. The combination with a refining plug, of a covering sleeve for said plug, said covering sleeve having a slot on one end thereof and an arm on said plug adapted to engage said slot in said covering to center and secure said covering on said plug.

4 A sleeve-supporting device comprising a tapering supporting member, a sleeve member carried thereby, said sleeve being adapted to be secured on said sleeve-supporting member by longitudinal movement of the one with relation to the other, and a fulcrumed arm for effecting such relative longitudinal movement.

5. A sleeve-supporting device comprising a tapering supporting member, a sleeve member carried thereby, said sleeve member being adapted to be secured on said sleeve supporting member by longitudinal movement of the one with relation to the other, a fulcrumed arm for effecting such relative longitudinal movement, and means for maintaining said arm in straight line position, said last-named means comprising lugs positioned to permit lateral movement of said arm.

6. A sleeve supporting device comprising a tapered supporting member, a sleeve member carried thereby and means for securing said sleeve upon said supporting member by exerting longitudinal pressure upon the sleeve member at spaced points located cir-

cumferentially of the body and intermediate the ends thereof.

7. A sleeve supporting device comprising a plug, a sleeve member carried thereby, said sleeve member being adapted to be secured on said sleeve supporting member by longitudinal movement of the one with relation to the other and an arm for effecting such relative movement, said arm being fulcrumed on said plug.

In testimony whereof we hereby affix our signatures.

LUDWIG H. WESSEL.
OSCAR E. LARSON.