

July 12, 1966

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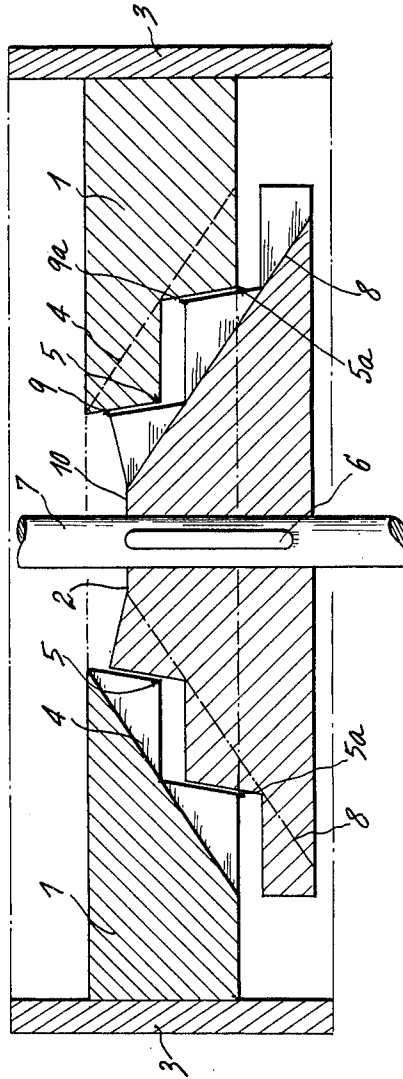
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DISCS FOR APPARATUSES FOR REFINING PAPER PULP

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3 Sheets-Sheet 1

Fig. 1



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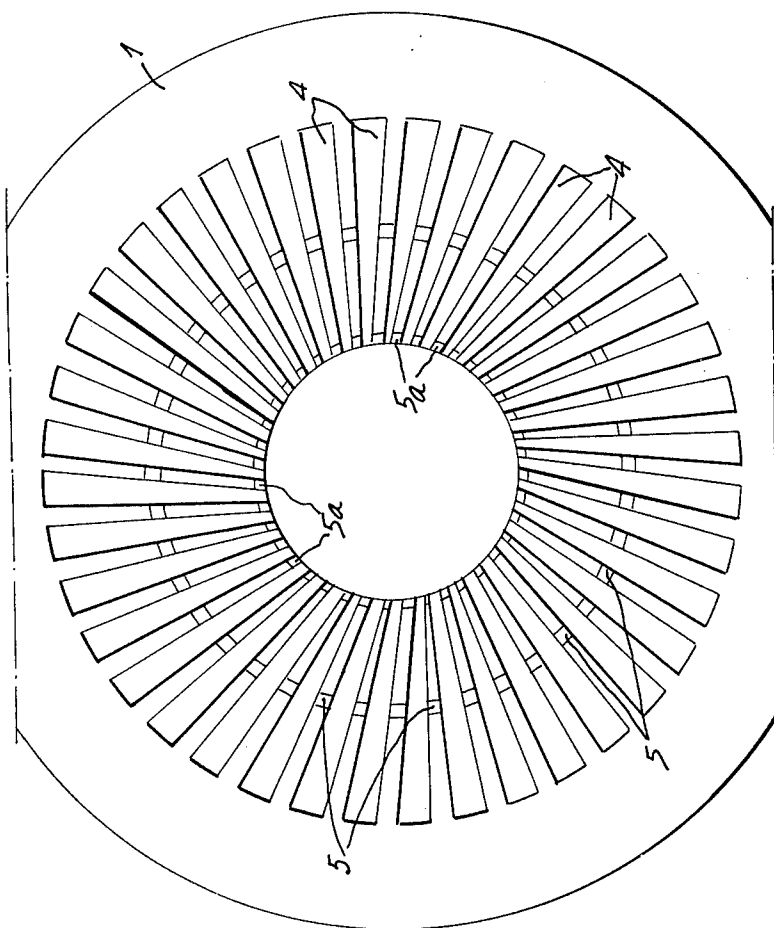


Fig. 2.

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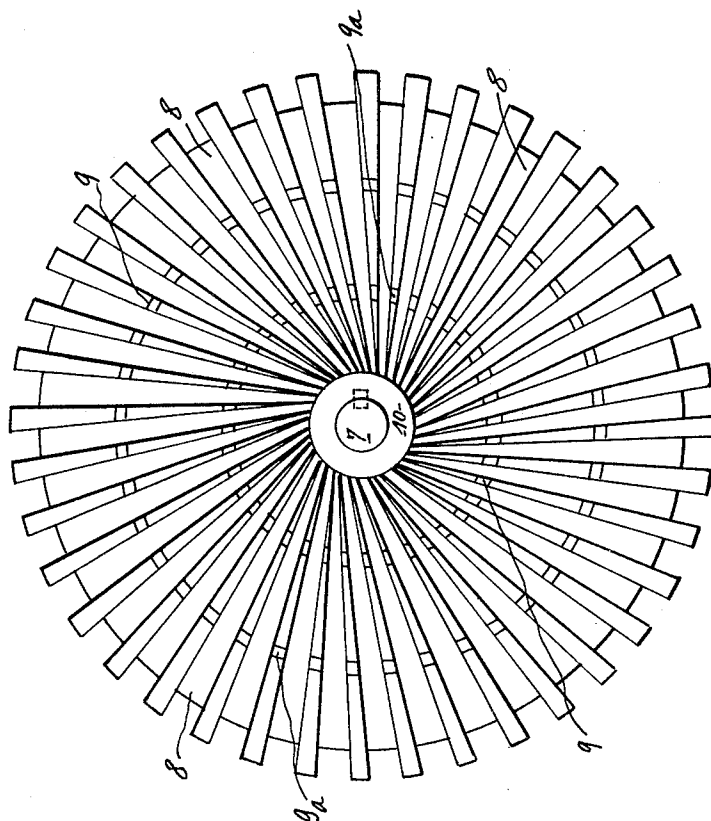


Fig. 3.

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## 3,260,469 DISCS FOR APPARATUSES FOR REFINING PAPER PULP

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4 Claims. (Cl. 241—257)

The present invention relates to discs for paper pulp refining apparatuses, arranged in pairs, one of them being fixed, while the other is movable.

According to the invention, two superimposed or juxtaposed discs, one of which forms the stator while the other one forms the rotor, are provided with grooves tangentially radiating, with serrated profiles and progressive width, and able to operate on a vertical or horizontal plane.

Various other characteristics will moreover be revealed by the detailed description which follows:

An embodiment of the invention is shown by way of example in the attached drawings.

FIGURE 1 is a sectional view of two superimposed or juxtaposed discs 1 and 2 (which, for purposes of a better understanding are shown in spaced relationship to each other, whereas they are actually engaging each other when in working condition).

The disc or stator 1, is fixed in a cylindrical housing 3 and comprises grooves 4, with a serrated profile 5 and sharp edges, the bottoms of the grooves forming a conical surface.

The disc or rotor 2 is held by means of a key 6 keyed to a revolving shaft 7. Disc 2 has grooves 8, similar to those of stator 2 with a serrated profile 9, meshing with serrated profile 5. The upper face 10 of disc or rotor 2 is slightly concave.

FIGURE 2 is a plan view of the lower face of the disc or stator 1. This view shows the position of the grooves 4 which radiate tangentially in a concentric circle shape of given dimension. It also shows how grooves 4 increase in width in the direction toward the outside.

FIGURE 3 is a plan view of the upper face of the rotary disc or rotor 2. Similar to FIG. 2, this view shows the same radiating and tangential position of the grooves 8, as well as the progressive increase of their width, in the direction from the centre of the disc towards the outer periphery thereof.

When rotor disc 2 revolves at a suitable speed, the centrifugal force injects into the grooves 8, the previously prepared pulp and conveyed to that point, as in customary apparatuses. The travel of the pulp in said grooves is interrupted by the momentary obstruction caused by the serrations 5 of the stator 1, which compels the pulp to pass through the air-gap of the opposite edges of the two discs in order to arrive in the grooves 4 of the stator 1. The serrations 9 of the rotor 2 then act in the same manner so that the pulp can return into the grooves 8 of the rotor 2 and so on, until final takes place at the external periphery where the pulp is collected for conveyance outside the apparatus by any known means.

The transverse alternate arrangement of the serrations 5 and 9 and the longitudinal one of the edges of the grooves 4 and 8, cause a rapid and successive opening and closing of the pockets thus formed. This results in short

and repeated compression and depression effects, which, added to the frictional action of the air-gap of the opposed edges of the two discs, imparts the desired characteristics to the material under treatment.

In view of the speed at which the rotor disc 2 revolves, the more or less great dilution of the pulp under treatment, and the more or less close adjustment of the air-gap of the edges of the two discs between them, all the usual qualitative effects sought can be obtained in the preparation of pulp for making paper and cardboard, whether it be the simple dissociation of the fibres, one from the other, or their more or less advanced refining.

A single pair of discs (rotor and stator) can be mounted in a simplified apparatus. The discs, arranged in successive pairs, can be mounted in series of variable number (with the requisite spacing), by superimposition on a vertical shaft or by juxtaposition on a horizontal shaft.

The diameter of the discs 1 and 2 may vary more or less; the material utilized, the number and dimension of the teeth 5 and 9, as well as the number and dimension of the grooves 4 and 8 can be varied without affecting the principle utilized.

The improvements realized by the invention are very important, especially in view of the fact that the pulp under treatment necessarily passes through the air-gap between the two discs a large number of times in a minimum period of time, by the action of the successive opening and closing of the pockets formed by the cut of the profiles of the grooves in serrations and by the rotary movement of the rotor disc. In contrast thereto in almost all of the conventional apparatuses, part of the pulp can travel in the bottom of the grooves up to the exit, without ever passing through the air-gap. On the other hand, the cutting of the profiles of the grooves into serrations constantly affords a receding profile, which forms one of the essential characteristics of it, which prevents long fibres from being hooked up, and hence, the choking of the grooves, no matter what their narrowness may be.

In such conditions, the invention enables appreciable economies to be effected in time and power, as compared with existing apparatuses, and can ensure outputs, from the smallest to the greatest, without losing any of its inherent qualities.

I claim:

1. A disc structure for paper pulp refining machines comprising a stator disc and a rotor disc, said discs having opposed faces, each face having grooves extending outwardly from a central portion toward the periphery, the bottoms of said grooves in said two discs forming parallel substantially conical surfaces, each disc having notches ribs intermediate said grooves to form angular steps in said ribs, the notches and steps in said discs being complementary and said discs being mounted with the steps and notches of the rotor disc rotatably interfitting the notches and steps, respectively, of the ribs of the stator disc.

2. The structure in claim 1, in which said ribs and grooves are at an angle to radii of said discs.

3. The structure in claim 1, in which the axially extending surfaces of said steps slope outwardly toward the periphery.

4. A disk structure for paper pulp refining machines comprising a stator disc and a rotor disc, said rotor disc

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having a hub portion mounted on a rotating shaft and ribs and grooves extending outwardly from said hub portion to the periphery, the bottoms of said grooves forming a conical surface and the ribs intermediate said grooves being notched to form projecting steps, said stator disc having ribs and grooves extending outwardly from a central aperture, the bottoms of said grooves forming a conical surface complementary to the conical surface on said rotor, the ribs intermediate the grooves on said stator disc being notched to form projecting steps complementary to the notched ribs on said rotor disc, so that the steps on the ribs of the rotor disc rotate in the notches between the steps of the stator disc.

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