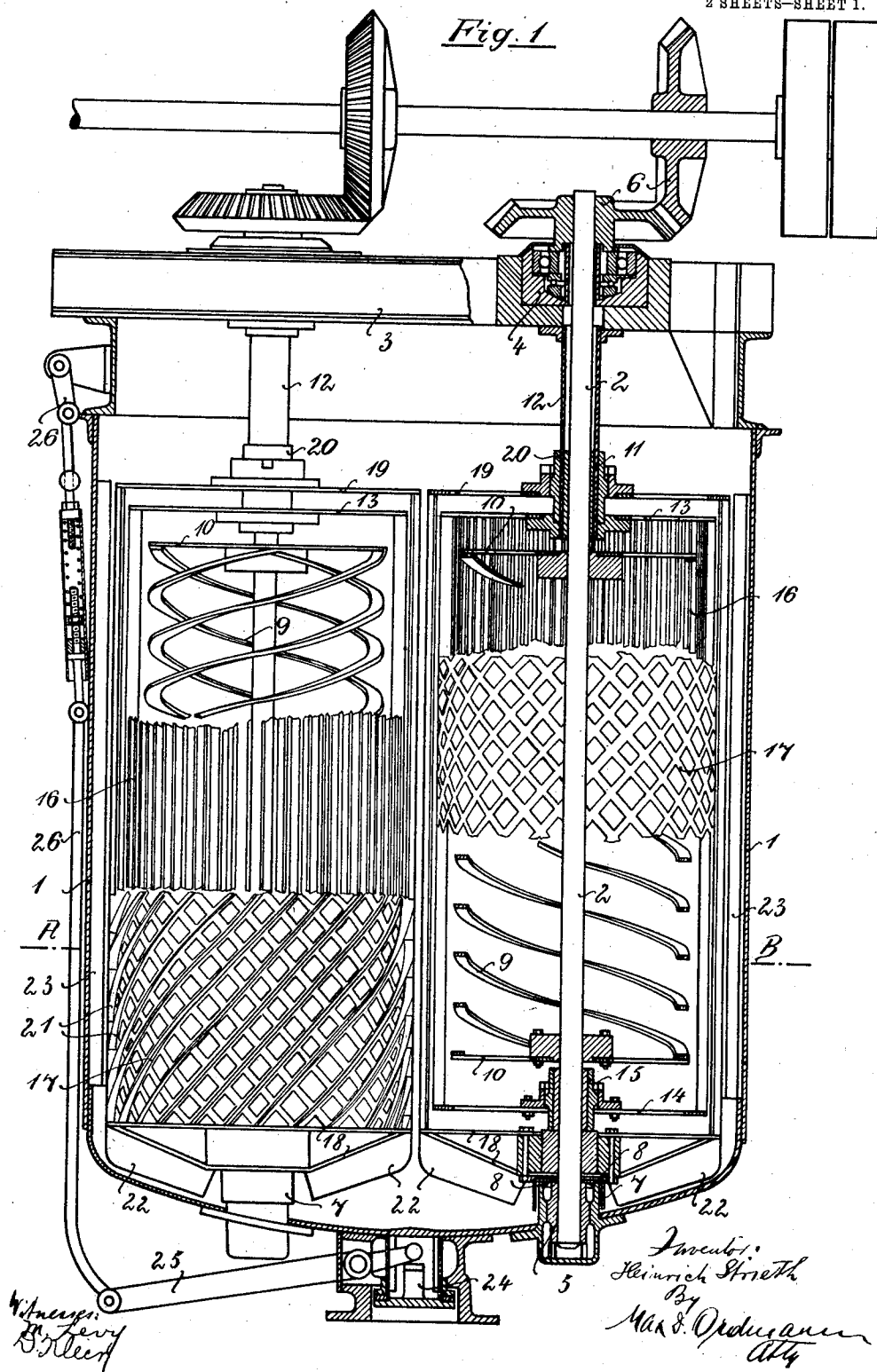




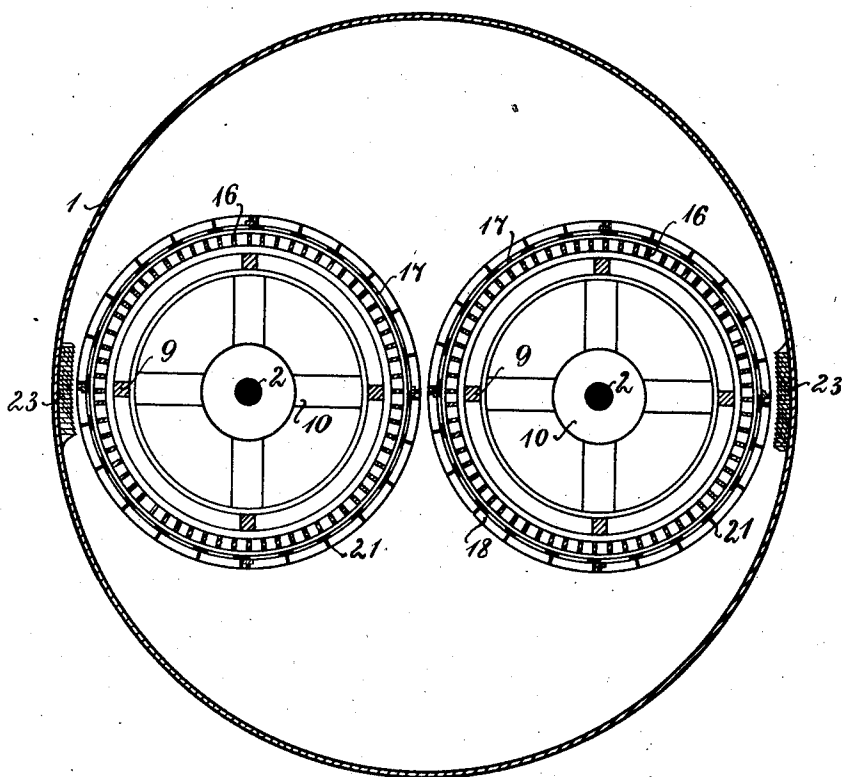
H. STRIETH.
PULPING APPARATUS.
APPLICATION FILED MAY 23, 1912.

1,058,641.

Patented Apr. 8, 1913.

2 SHEETS—SHEET 2.

Fig. 2



Witness:
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UNITED STATES PATENT OFFICE.

HEINRICH STRIETH, OF NUREMBERG, GERMANY.

PULPING APPARATUS.

1,058,641.

Specification of Letters Patent.

Patented Apr. 8, 1913.

Application filed May 23, 1912. Serial No. 699,297.

To all whom it may concern:

Be it known that I, HEINRICH STRIETH, a citizen of the German Empire, residing at Harsdörferplatz 4, Nuremberg, Bavaria, Germany, have invented new and useful Improvements in Pulping Apparatus, of which the following is a specification.

My invention relates to improvements in pulp mills to be used in the manufacture of paper and the like and the object of my invention is to provide for an apparatus permitting the comminution of fibrous raw material or waste, particularly printed or written-on paper, waste pasteboard, etc., together with its soaking, washing, dissolution, its mixture with any fluid ingredient and its working into a uniform pulp ready for further manufacture, all in one apparatus and by one uninterrupted process.

I attain my object by the construction and arrangement of parts, as herein described and as illustrated on the drawing herewith in which—

Figure 1 is a vertical section of my new apparatus, a few of its prominent features being, however, shown in elevation, and Fig. 2 is a transverse section on the line A—B of Fig. 1.

The drawing shows a tank 1 containing a pair of pulpers, though the number of those pulpers is not essential, each comprising an easily rotatable shaft 2 the top-end of which may be passed through ball-bearings 4 and carry means, as for instance, bevel gears 6, for connection with a rotating mechanism, the said ball bearings 4 being seated in a common cross-beam or head 3. The bottom-end of the said shaft 2 is mounted in a step-box 5 covered by a box cover 7 in which there may be provided annular projecting disks 8 adapted to conduct any lubricating oil hurled off from the shaft back into the oil cup. The shaft 2 is surrounded and in fact forms part of an agitator consisting of a plurality of helically twisted flat propeller coils 9 making up a cylindric screw seated in the heads 10 on top and at the bottom of the said screw. The said screw is embraced by a cylinder made up of upright wooden slats arranged peripherally with interstices or perforations left between, the diameter of the intersticed flat cylinder or drum thus formed being put a trifle larger than that of the screw agitator. The top-head 13 of this

drum is suspended from the aforesaid beam 3 or rather a sleeve 12 attached thereto and inserted with its lower end in a box 20 holding a bushing 11 in which the shaft 2 turns, while the bottom head 14 is mounted in another box 15. This slat cylinder is again closely surrounded by another wooden cylinder 17 which is in fact a revolving screen, its shell or body being of lattice work made up of interlacing, helically twisted and ribbed strips 21 between a pair of heads 18, 19, the top-head 19 being rotatably secured in the box 20. Thus the inner slat cylinder is motionless while the revolving screen 17 moves closely around it.

It will be readily understood that the agitator works axially and radially upon the matter under operation in the tank and the matter itself by the operation in opposition to each other of the parts described undergoes repeated comminution, soaking, washing and mixing. To further increase this action I provide the portions inside of the tank which are close to the rotating screen 17 with longitudinal outstanding cutting blades 23 the cutting edges of which are pointing against the ribs 21 of the said rotating screen and which are so disposed that in their aggregation they form a file surface. Of these blades one is grooved slantingly toward the bottom, forming a canal in which the matter forced thereagainst by the rotating screen ascends, so that any matter scraped or shaved off is again continuously forced against the file surface. The bottom heads 18 of the screens 17 are provided with radial paddle blades 22 pointing with their edges toward the bottom of the tank 1.

To permit an emptying of the tank 1 there may be provided in the bottom a valve 24 controlled by a lever 25 supported in the valve case. In the construction illustrated it is supported and operated from a knee-jointed lever 26 provided with an elastic gear and supported on the outside of the tank.

When the shafts 2 in the pulpers in a tank are made to rotate the agitators 9 and the cylindric screens 17 are made to follow while the cylinders 13 suspended, as aforesaid, from the sleeves 12 remain motionless. With the said cylinders 17 also the blades 22 are turning and throw the matter arriving at the bottom outward. The matter present within the slat cylinder, though having a

tendency to sink, is prevented therefrom by the speedily revolving agitator which after having accomplished a very thorough mixture forces the matter coming forward through the interstices between the vertical slats outward, the matter under operation becoming at the same time comminuted between the edges of the slats and those of the agitator screw. The matter gushing forth from the slat cylinders is forced along by the screen 17, also revolving at a speedy rate and is again comminuted between the external edges of the slats and the edges of the lattices of the revolving screen, being at the same time mixed and by the speedy revolution of the cylinders forced through the meshes of the same. It is then taken along and forced over the edges of the aforesaid blades, there to undergo another comminution and thorough mixture. Any matter stripped during the operation from the foremost of those blades ascends within the aforesaid groove and is again forced against and over the cutting edges. The finished pulp now flows down and is put aside by the paddles 22. Whenever a sufficient quantity of pulp has collected in the bottom of the tank it may be discharged by opening the valve 24.

Of course, my invention may be carried out without adhering strictly and in every respect to the example illustrated and the means of operating the several elements described, their construction and support may be changed in various ways without going beyond the scope of my invention.

I claim:

1. An apparatus for comminuting, dissolving, washing and thoroughly mixing fibrous matter, as herein referred to, comprising the combination of a tank, a rotatable agitator or agitators therein, a motionless intersticed slat cylinder embracing each of the said agitators, a rotatable cylindric screen embracing the said cylinder having external ribs, and file surfaces attached to the inside of the tank and means adapted to rotate the said agitators and cylindric screens, the spaces between the said agitators, slat cylinders, rotatable screens and file surfaces being respectively very close, sub-

stantially as described and for the purposes set forth.

2. An apparatus as herein referred to comprising the combination of a tank, a rotatable screw agitator or agitators, an intersticed cylinder disposed around each agitator and a rotatable cylindric screen closely embracing each of the intersticed cylinders, the said screw agitators and cylindric screens being secured to a common shaft each, while each of the said intersticed cylinders is independently connected with a motionless sleeve surrounding the agitator shaft, substantially as described.

3. In an apparatus as herein described a revolving cylindric screen closely embracing a motionless intersticed slat cylinder which in turn closely incloses a screw agitator, the said revolving screen consisting of lattice work made up of interlacing, helically twisted ribs, substantially as described.

4. In an apparatus as herein described comprising a tank, a revolving screw agitator or agitators, a non-revoluble intersticed slat cylinder closely embracing each of the said agitators, a rotatable cylindric screen closely embracing each of the said slat cylinders, the combination therewith of file surfaces made up of longitudinal blades having cutting edges pointed against the said rotatable cylindric screens, one of the blades of each file surface being slantingly grooved, substantially as described and for the purpose mentioned.

5. In an apparatus as herein described comprising a tank, a revolving screw agitator or agitators, a non-revoluble intersticed slat cylinder closely surrounding each screw and a revoluble cylindric screen surrounding each of the said slat cylinders, the combination therewith of radial paddle blades pointing toward the bottom of the tank and attached to the bottom heads of the said revolving screens, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HEINRICH STRIETH. [L. S.]

Witnesses:

HELEN NUFER,
ALBERT NUFER.