W. M. SCHWARTZ.

DRIER.

APPLICATION FILED OCT. 20, 1919.

1,377,793.

Patented May 10, 1921.

2 SHEETS—SHEET 1.

Fig. 1.

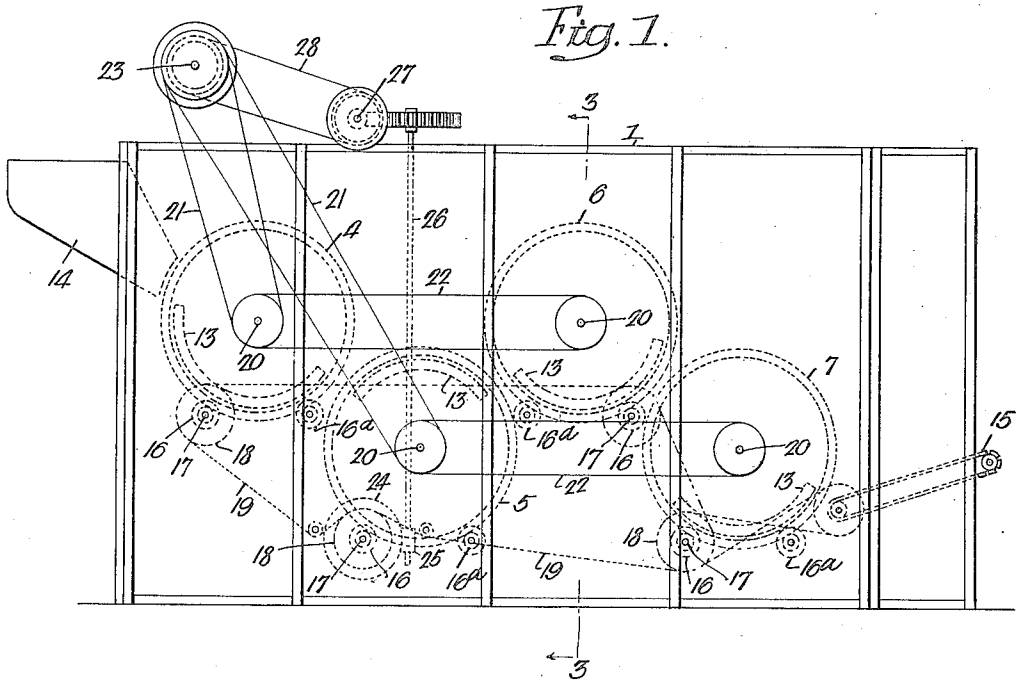
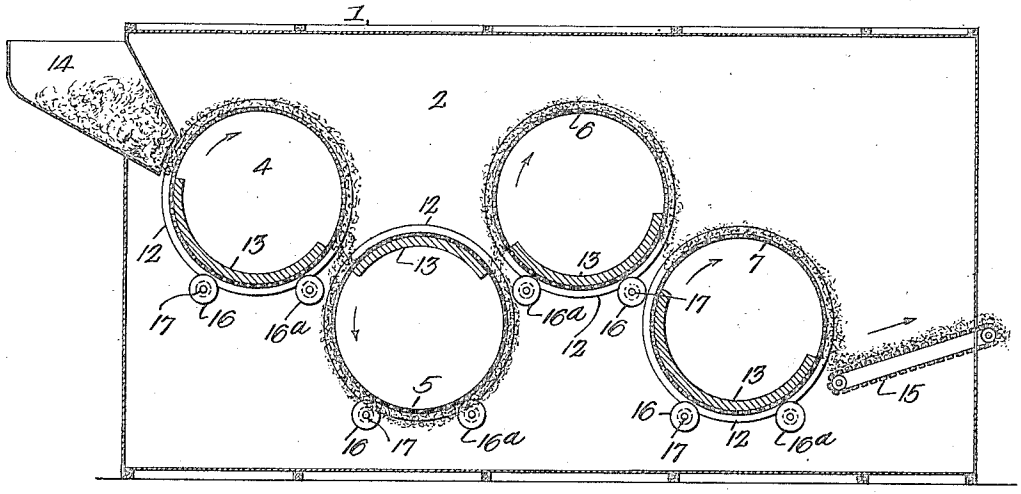


Fig. 2.



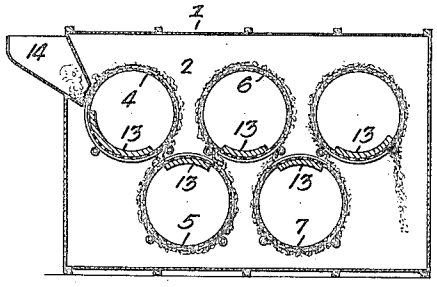


Fig. 6.

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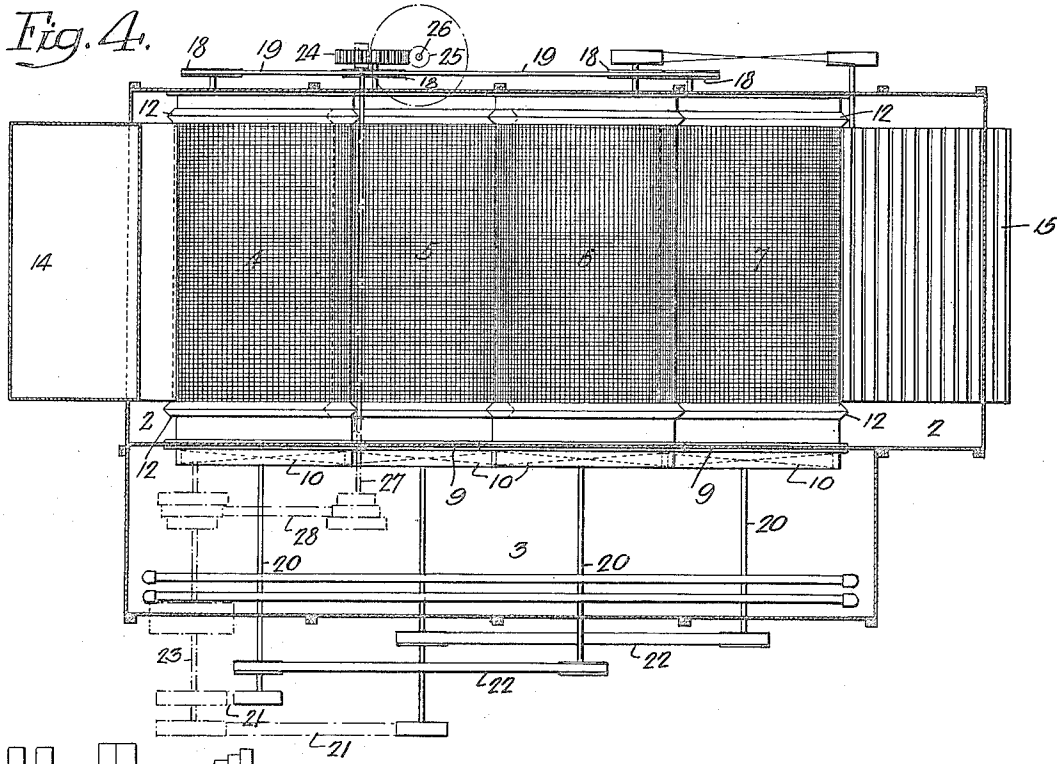
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2 SHEETS—SHEET 2.

Fig. 4.



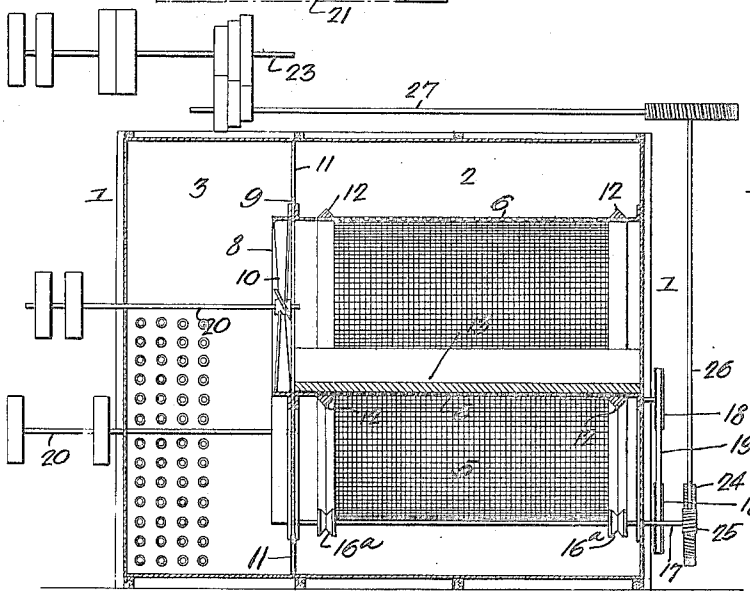
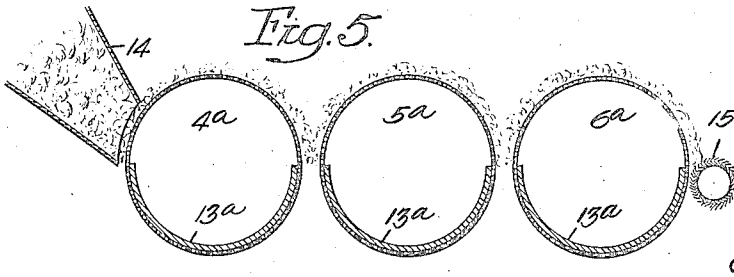


Fig. 3.

Fig. 5.



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UNITED STATES PATENT OFFICE.

WALTER M. SCHWARTZ, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE PHILADELPHIA TEXTILE MACHINERY COMPANY, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

DRIER.

1,377,793. Specification of Letters Patent. Patented May 10, 1921.

Application filed October 20, 1919. Serial No. 331,793.

To all whom it may concern:

Be it known that I, WALTER M. SCHWARTZ, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Driers, of which the following is a specification.

The object of my invention is to construct a drier provided with a drying chamber in which heated air is in circulation and to provide rotary means for conveying the material from the feed end to the discharge end of the drier.

In the accompanying drawings:

Figure 1 is a side view of a drying machine illustrating my invention;

Fig. 2 is a longitudinal sectional view;

Fig. 3 is a transverse sectional view on the line 3—3, Fig. 1;

Fig. 4 is a sectional plan view; and

Figs. 5 and 6 are views illustrating modifications of the arrangement of the drums.

1 is the casing having a drying chamber 2 and a heating chamber 3, in which are coils of steam pipe, or other heating devices. Fans are provided for circulating air through these two chambers. In the present instance, in Figs. 1 to 4, I have shown four cylinders, 4, 5, 6 and 7. Each cylinder is open at each end, and one end of each cylinder is closed by the casing. At the opposite end is a fan 10, which is located in the passage 8 formed in the partition 9 between the drying chamber and the heating chamber. There are also passages 11 for the return of the heated air at the upper and lower ends of the partition 9, separating the two chambers. The cylinders are covered with wire gauze, or perforated metal, of any suitable mesh, according to the material to be conveyed so that, when the material is fed to the cylinders, the suction of the fans causes the air to pass from the drying chamber into and through the cylinders. This, in turn, causes the material to adhere to the periphery of the cylinders.

13, 13 are segmental guards in each cylinder secured in a fixed position in any suitable manner. The guards, in the first, third and fourth cylinders 4, 6 and 7, are in the lower portion of the cylinders, while the guard in the cylinder 5 is in the upper portion thereof, as clearly shown in Fig. 2. One guard commences where another terminates. These guards cut off the air from the cylinders so that when the material, carried by the cylinders, reaches the guards it is free to be drawn off, or falls off, due to the fact that the suction has ceased.

14 is a feed hopper from which material is taken by the cylinder 4, and a doffing apron 15 can be used to receive the material from the last cylinder 7, although, in some instances, a doffing roll, as at 15^a, Fig. 5, can be used, or the material can fall off of the cylinder by gravity. The cylinders have V-shaped rings 12, as shown in Fig. 3, which rest upon the wheels 16 and 16^a having V-shaped grooves corresponding to the rings of the cylinders. In the present instance, the wheels 16 are mounted on driven shafts, while the wheels 16^a are idlers. One method of driving the shafts is clearly shown in Figs. 1, 3 and 4.

The shafts 17, on which the wheels 16 are mounted, have sprocket wheels 18 to receive a drive chain 19. The fans 10 are independently driven from the cylinders and are mounted on shafts 20 extending through the cylinders and are driven by belts 21 and 22 from an overhead shaft 23. The lower shaft 17, directly under the cylinder 5, is a driven shaft and has a worm wheel 24, with which meshes a worm 25 on a shaft 26 geared to a shaft 27 by worm gearing which, in turn, is driven from the power shaft 23 by a belt 28. While I have shown one form of driving mechanism for the cylinders and fans, other means of driving may be resorted to without departing from my invention.

In Fig. 5, I have shown the cylinders 4^a, 5^a and 6^a on the same horizontal plane and all of the guards 13^a are located at the lower portion of the cylinder so that the material is carried only on top of the cylinders, being finally removed by a doffer 15^a. The same arrangement of fans is used as in the construction shown in Fig. 1.

In Fig. 6, I have illustrated a series of cylinders placed in two rows and located close together, the material being carried over the upper cylinders and under the lower cylinders. This construction allows the material to occupy a considerable portion of the cylinders, the material, in this instance, falling off of the last cylinder by gravity.

It will be seen from the above description

that the material to be dried can be fed into the hopper and will be taken up by the first cylinder and carried solely by this cylinder until the edge of its guard is reached, when the material will be transferred to the second cylinder, as the suction of the first cylinder has ceased to attract it and the suction of the second cylinder is sufficient to draw the material from the first cylinder to the second cylinder. The material is carried by the second cylinder and is transferred to the third cylinder and finally to the fourth cylinder from which it is removed by the doffer, or it is allowed to fall from the cylinder owing to the lack of suction.

In drying some materials, it may require a greater number of cylinders, and, in some instances, a single cylinder may answer the purpose.

I claim:

1. The combination in a drier, of a drying chamber; a series of cylinders mounted in the chamber; means for creating a suction in the cylinders, said cylinders having a perforated periphery; means for cutting off the perforations at a certain point; and means for feeding material to the first cylinder, the parts being so arranged that the material will adhere to the first cylinder by suction and then will be released and drawn to the second cylinder of the series and carried by it to a discharge point.

2. The combination in a drier, of a drying chamber; a heating chamber; a series of cylinders located in the drying chamber and arranged close together, each cylinder having a perforated periphery; segmental guards located in the cylinders; fans at one end of each cylinder for creating suction within the cylinders; and means for feeding material to the first cylinder, the guards being so arranged that the material will be carried by the first cylinder to the guards and will be released by the guards cutting off the suction in the first cylinder and will be transferred by the suction to the second cylinder to the periphery thereof and then transferred in a like manner to the other cylinders of the series and finally discharged

3. The combination of a drier having a drying chamber and a heating chamber; a series of cylinders mounted in the drying chamber, said cylinders being arranged close together, the periphery of the cylinders being perforated; segmental guards located within each cylinder, the end of one guard terminating at the beginning of the other guard so that material fed onto the first cylinder will be transferred to the second cylinder throughout the length of the machine; means for slowly driving the cylinders; and fans in the partition separating the drying chamber from the heating chamber and in line with the cylinders so that the heated air will be circulated outside of the cylinders and will be drawn into the cylinders and discharged into the heating chamber.

WALTER M. SCHWARTZ.