

J. A. HEANY.
 DEHYDRATING MACHINE.
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 2 SHEETS—SHEET 1.

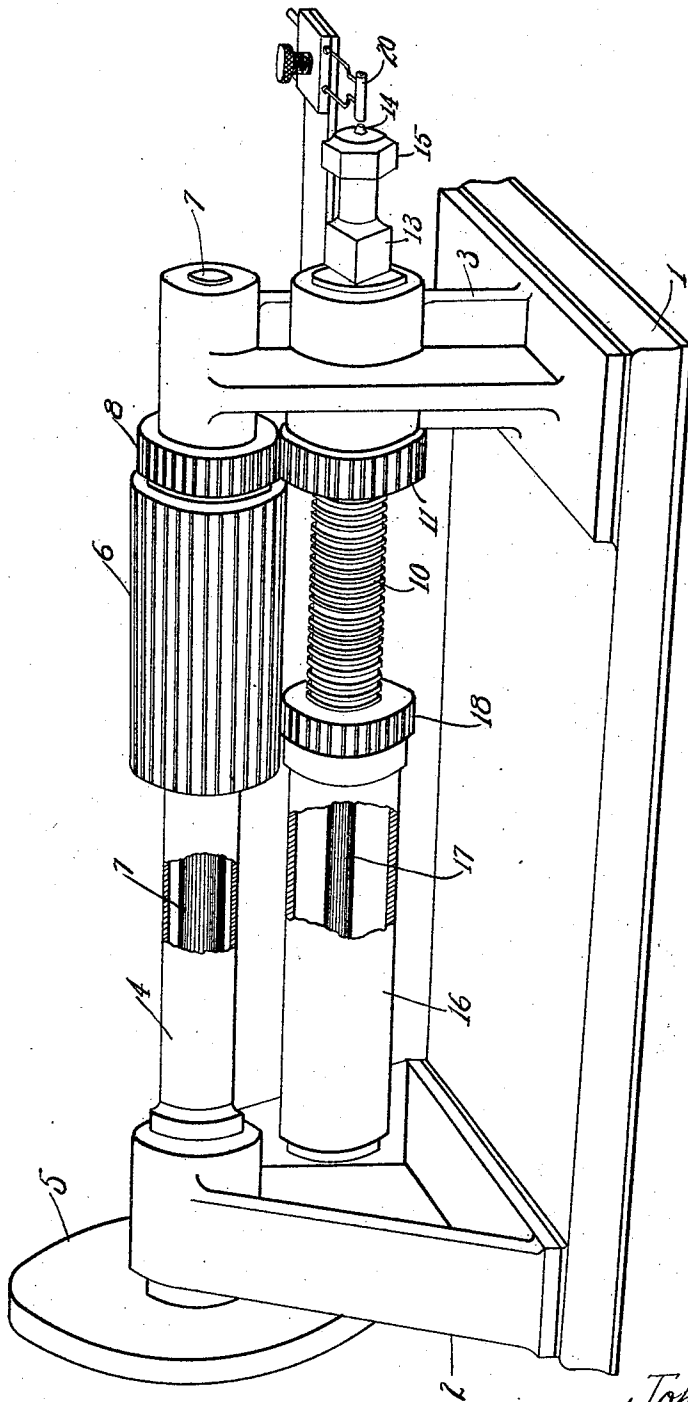
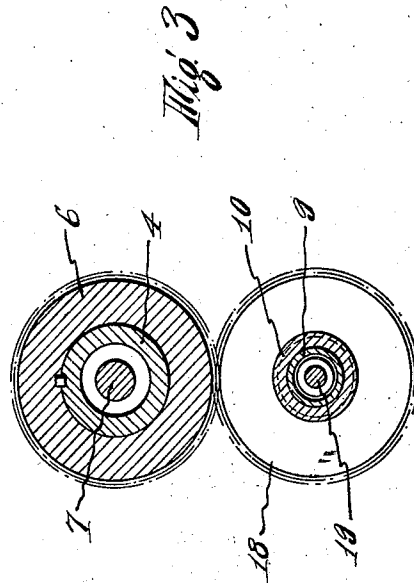


Fig. 1

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2 SHEETS—SHEET 2:



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DEHYDRATING MACHINE.

1,414,184.

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To all whom it may concern:

Be it known that I, JOHN ALLEN HEANY, a citizen of the United States, residing at the city of New Haven, county of New Haven, and State of Connecticut, have invented a certain new and useful Dehydrating Machine, of which the following specification is a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to a machine for dehydrating materials such as thoria, zirconia, and the like, and more particularly to a mechanism in such a machine for extruding the material to be dehydrated through a die to form a thread or the like which may be subjected to the heat necessary to dehydrate it.

It is the object of this invention to provide in a machine of this character a mechanism whereby a mass of thoria or the like in plastic condition is formed into a long thread of small cross section.

An additional object of the invention is the arrangement of the elements thereof so that the machine will automatically perform its function over a long period of time without attention.

This machine is utilized in connection with an oxyhydrogen burner to dehydrate such materials as thoria and zirconia, which in their natural state contain quite a bit of water of crystallization. The thread of oxide is passed directly from the die of the machine through a burner, the flame from which is directed against the entire surface of the thread whereby the latter is subjected to the necessary heat.

Other objects, features and advantages of the invention will be apparent from a reading of the following specification and appended claims.

Referring now to the drawings:

Fig. 1 is a perspective view of the machine, a small part being broken away.

Fig. 2 is a vertical longitudinal section;

Fig. 3 is a section on line 3—3 of Fig. 2.

The base 1 has at its ends the brackets 2 and 3. Journalled in the bracket 2 is the sleeve 4 carrying a pulley or worm gear 5 at one end and an elongated pinion 6 at the other end. Inside of this sleeve is a shaft 7 which passes through the entire length of the sleeve and extends beyond the ends of the sleeve. One end of this shaft is jour-

nalled in the sleeve and the other end in the bracket 3. Keyed to this shaft is the pinion 8. The shaft is rotatable independently of the sleeve, and a clutch not shown, is provided whereby the shaft and sleeve may be made to rotate in unison.

The tubular member 9 is supported in the bracket 3 and has journalled thereon the threaded sleeve 10 to one end of which is attached the pinion 11. In the outer end of the tubular member is the threaded socket 12 in which is carried the barrel 13. A conical shaped die 14 is provided at the outer end of the barrel and is held by means of a cap 15 having an opening for the small end of the die to extend through. A threaded follower 16 is mounted on the sleeve 10 and carries a piston 17 of a diameter about that of the inside diameter of the tubular member 9. On the front end of the follower is a pinion 18. A plunger 19 is provided which is pushed into the barrel 13 by the piston 17. The pinion 6 has one more tooth than the pinion 8, and the pinion 18 has one less tooth than the pinion 11.

A hollow burner 20 is supported on the machine in alinement with the die 14 for the purpose of uniformly subjecting the filamentary body to a high heat immediately upon its exit from the die.

In the operation of my device the follower is moved to its proper position by releasing the shaft 7 from the sleeve 4 through the medium of the clutch 21 and rotating the shaft 7 relative to the sleeve 4, thereby causing the rotation of the sleeve 10. Since the follower 16 is prevented from rotation by the engagement of the pinions 6 and 18, the follower can be quickly moved to the position shown in Fig. 2. The material to be dehydrated is mixed with a dissipating binder and the plastic mass is placed in the barrel 13. The plunger 19 is inserted a short way into the barrel 13 and then the whole thing is inserted in the tubular member 9 and the barrel is screwed into the socket 12, after which the piston is brought into engagement with the plunger. The clutch is then operated to lock together the shaft 7 and sleeve 4 and power is applied to the wheel 5. Due to the fact that the pinions 6, 8, 11 and 18 have different numbers of teeth, the follower 16 will rotate a trifle slower than the sleeve 10 and will be fed along the thread on the sleeve 10 very slowly. The piston 17 engages the plunger

19 pushing the same forward. This causes the material in the barrel to pass through the die assuming a thread-like form, then into the channel member of the burner. As it passes out of the end of this channel member it is subjected to an oxyhydrogen flame which drives off the binder and dehydrates the material. The flame is conical in shape and so treats all portions of the thread of refractory material alike.

The specific embodiment of the machine as disclosed in the drawings and specification is the preferred form of my invention, but I do not intend to limit myself to such disclosure but rather by the state of the art as disclosed by prior patents.

I claim as my invention:

1. In a dehydrating machine, a barrel, a shaft, a plunger reciprocally mounted in said barrel, means to force said plunger through said barrel comprising a rotary threaded member, a threaded follower mounted on said shaft, means carried by said follower to engage said plunger, and means to rotate said shaft and said sleeve relative to said shaft.

2. In a dehydrating machine a barrel, a plunger, means to force the plunger into the barrel including a drive shaft, two pinions on said shaft, one having more teeth than the other, a threaded sleeve rotatably mounted and encircling said plunger, a threaded follower engaging said threaded sleeve, pinions carried by said sleeve and follower and means on the follower to engage the plunger.

3. In a dehydrating machine, a barrel, a plunger reciprocally mounted in said barrel, means to force said plunger through said barrel, comprising a drive shaft, a second shaft surrounding said first shaft,

means to drive one of said shafts, means to connect and disconnect said shafts, a pinion on each shaft, a threaded sleeve rotatably mounted and surrounding said plunger, a threaded follower engaging said sleeve, a pinion on each of said last members in mesh with one of the two above-mentioned pinions, three of the pinions having the same number of teeth, and the fourth having a different number, and means on the follower to engage the plunger.

4. In a dehydrating machine, a barrel, a plunger reciprocally mounted in said barrel, means to force said plunger through said barrel, comprising a drive shaft, pinions driven by said shaft, a threaded sleeve rotatably mounted and surrounding said plunger, a threaded follower engaging said sleeve, a pinion on each of said last members in mesh with one of the two above-mentioned pinions, the pinions bearing such relation to each other that the follower rotates relative to the sleeve, and means on the follower to engage the plunger.

5. In a dehydrating machine, a barrel, a plunger reciprocally mounted in said barrel, means to force said plunger through said barrel comprising a drive shaft, a threaded sleeve rotatably mounted and surrounding said plunger, a threaded follower engaging said sleeve, means between said drive shaft and said sleeve and follower whereby said sleeve and said follower are rotated at different speeds, and means on the follower to engage the plunger.

6. In a dehydrating machine, a barrel, and means to force the material to be dehydrated through said barrel, comprising a plunger and differential means for operating the latter.

JOHN ALLEN HEANY.