

W. R. SEIGLE.
METHOD OF CONSTRUCTING-WOUND PAPER TUBES.
APPLICATION FILED OCT. 9, 1911.

1,040,438.

Patented Oct. 8, 1912.

2 SHEETS-SHEET 1.

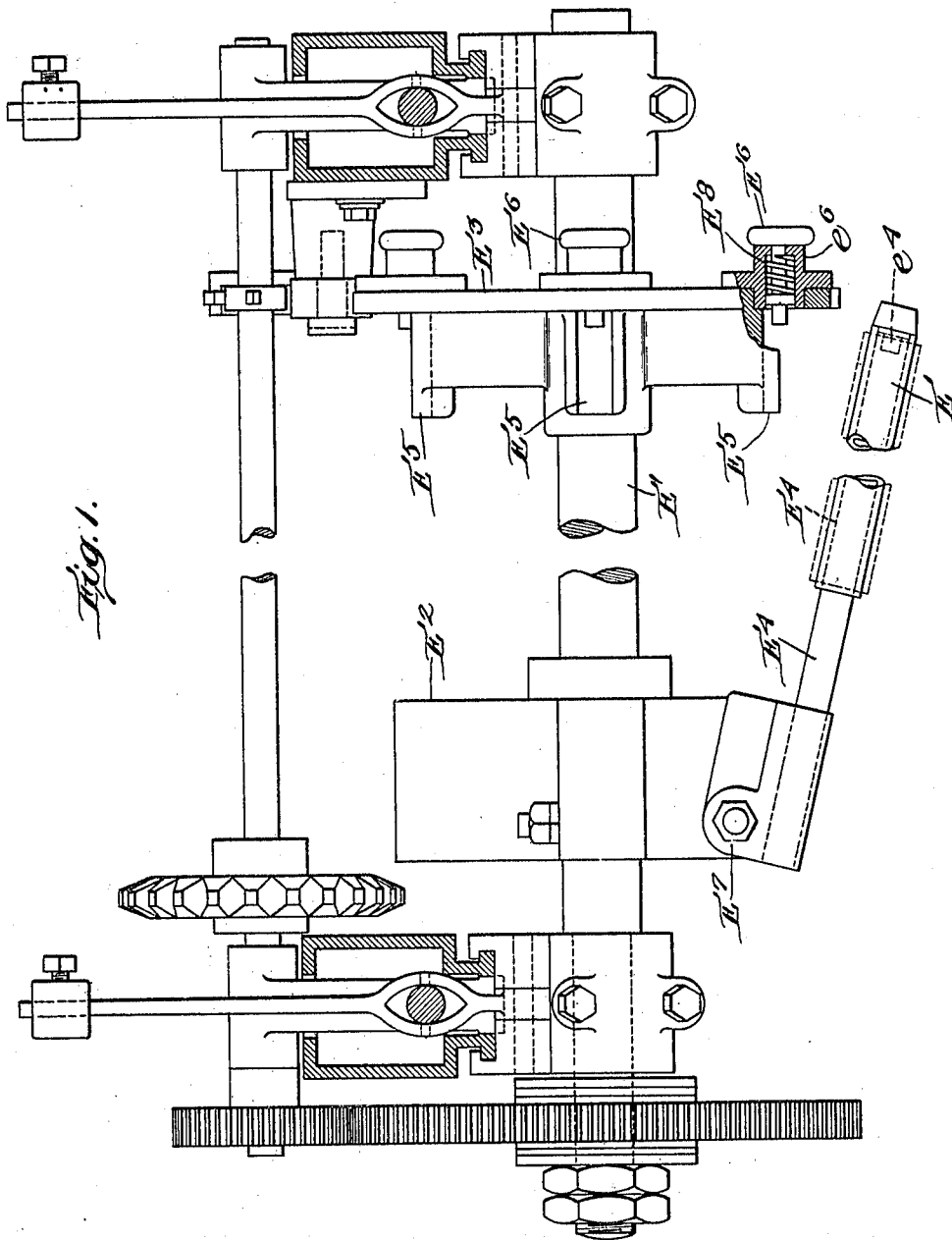


Fig. 1.

Witnesses

Josephine H. Ryan
Charles D. Woodbury

Inventor:

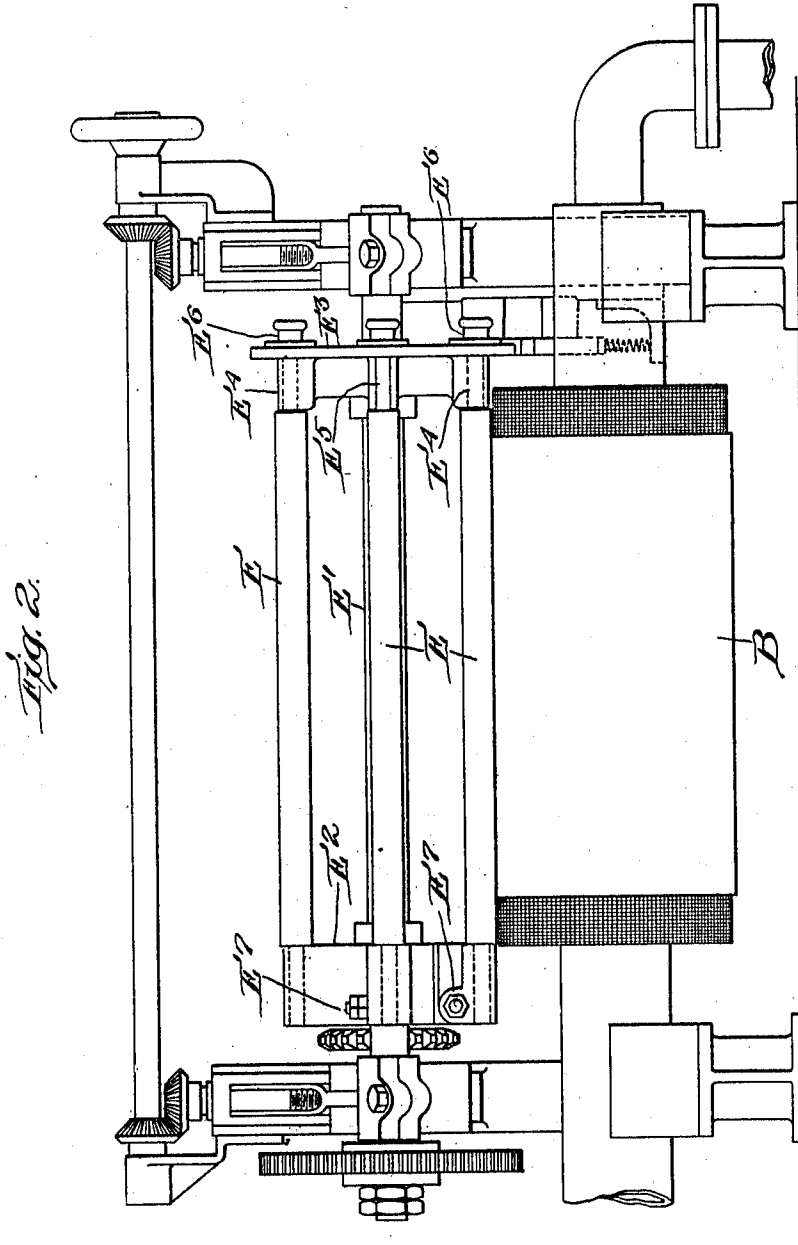
William R. Seigle
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UNITED STATES PATENT OFFICE.

WILLIAM R. SEIGLE, OF NASHUA, NEW HAMPSHIRE.

METHOD OF CONSTRUCTING WOUND PAPER TUBES.

1,040,438.

Specification of Letters Patent.

Patented Oct. 8, 1912.

Original application filed June 2, 1911, Serial No. 630,921. Divided and this application filed October 9, 1911. Serial No. 653,579.

To all whom it may concern:

Be it known that I, WILLIAM R. SEIGLE, a citizen of the United States, and resident of Nashua, in the county of Hillsboro and State of New Hampshire, have invented new and useful Improvements in Methods of Constructing Wound Paper Tubes, of which the following is a specification.

My invention consists in a method of constructing wound paper tubes.

The objects attained by the practice of this method are the avoidance of distortion and crushing of wound paper tubes, and their production with rapidity and uniformity.

In the accompanying drawings, which show portions of a machine on which the initial steps in my new method are performed,—Figure 1 shows part of a machine in plan; and Fig. 2 shows a mandrel frame thereof in section.

The machine illustrated forms the subject matter of applications for patent heretofore filed by me, Serial Numbers 630,921, and 630,922, filed June 2, 1911. Such a machine forms a moist web of felted fiber couching from a cylinder rotating in the pulp vat, on to a carrier, and then couches this moist web from the carrier to a mandrel which winds the thin moist web into a tube, which when completed, is a paper tube.

The tube winding mandrels are shown in the drawings at E and are mounted in a mandrel frame which comprises a shaft E' and heads E² and E³.

The mechanism of the tube winding machine comprises devices for intermittently rotating a mandrel frame so as to present fresh tube winding mandrels to the paper web carrier B which delivers a web of paper to be wound spirally under pressure on each mandrel when it is in proper position. The mandrel itself, that is to say, the cylindrical body on which a paper tube is wound, consists of a tube E which is so proportioned as to slide over the mandrel core E⁴ with a fairly close sliding fit. The mandrel core E⁴ is journaled at one end on one of the blocks E⁷ mounted in the frame head E² and at the other end on one of the half bearings E⁵ in which the mandrel core is held centered by a spring controlled sliding pin E⁶. When a tube has been wound spirally, in a number of superposed closely coherent

layers upon one of these mandrels and is presented at the front of the machine by the rotation of the mandrel frame, the workman pulls out the pin E⁶ which slides in the housing e⁸ thus withdrawing the end of the pin E⁶ from the bore e⁴ in the end of the mandrel core E⁴, enabling the mandrel to be swung out to the position shown in Fig. 2, when the mandrel proper, that is to say, the tube E with the paper tube wound upon it, may readily be slipped off the mandrel core E⁴ upon which a new bare mandrel tube E is placed; then the bare mandrel E and its core are swung back into place, the pin E⁶ being inserted and held in the bore e⁴ by means of the spring E⁸.

By means of the above described device the paper tubes are quickly and easily removed from the machine and are moreover held supported internally by the tubular mandrel E so that during the conveyance to the drying room and during the operation of drying thereafter each paper tube is held in perfect shape by its metallic internal support. Further, as soon as the paper tube on its metallic support is introduced into the drying room, the high temperature therein causes the metallic support E to expand slightly and thus to hold the paper tube firmly and tightly, maintaining close contact between the inner surface of the paper tube and the outer surface of the metallic tube, so that the moisture in the paper tube must all escape outwardly. This insures a drying of the tube from the outside inward and causes each successive drying portion to shrink tightly upon those portions of the tube which lie inside it, so that when the tube is completely dry it is entirely free from laminations, is compact, straight and of true cylindricity. Then when the tubes are cooled the metallic interior support shrinks away from the inside of the paper tube and slips out very easily. At no stage in the operation of the tube manufacture is the tube subjected to any but the gentlest handling. For this reason waste due to injury of the paper tube is avoided and the quality of the output improved.

The materials of which tubular mandrels are composed should be such as to resist corrosion in the presence of moisture and such substances as may be included in the

paper web. I have found aluminum to be entirely adequate for the purpose, and recommend its employment.

What I claim and desire to secure by Letters Patent is:

The method of constructing wound paper tubes, which consists in winding a moist pulp-web spirally under pressure upon a mandrel, heating the mandrel with the paper-tube thereon, thus expanding the

mandrel and drying the moist pulp tube from the outside inwardly then allowing the mandrel to cool and contract away from the paper tube.

Signed by me at Boston, Massachusetts, 15 this twenty ninth day of September, 1911.
WILLIAM R. SEIGLE.

Witnesses:

ODIN ROBERTS,

CHARLES D. WOODBERRY.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."