

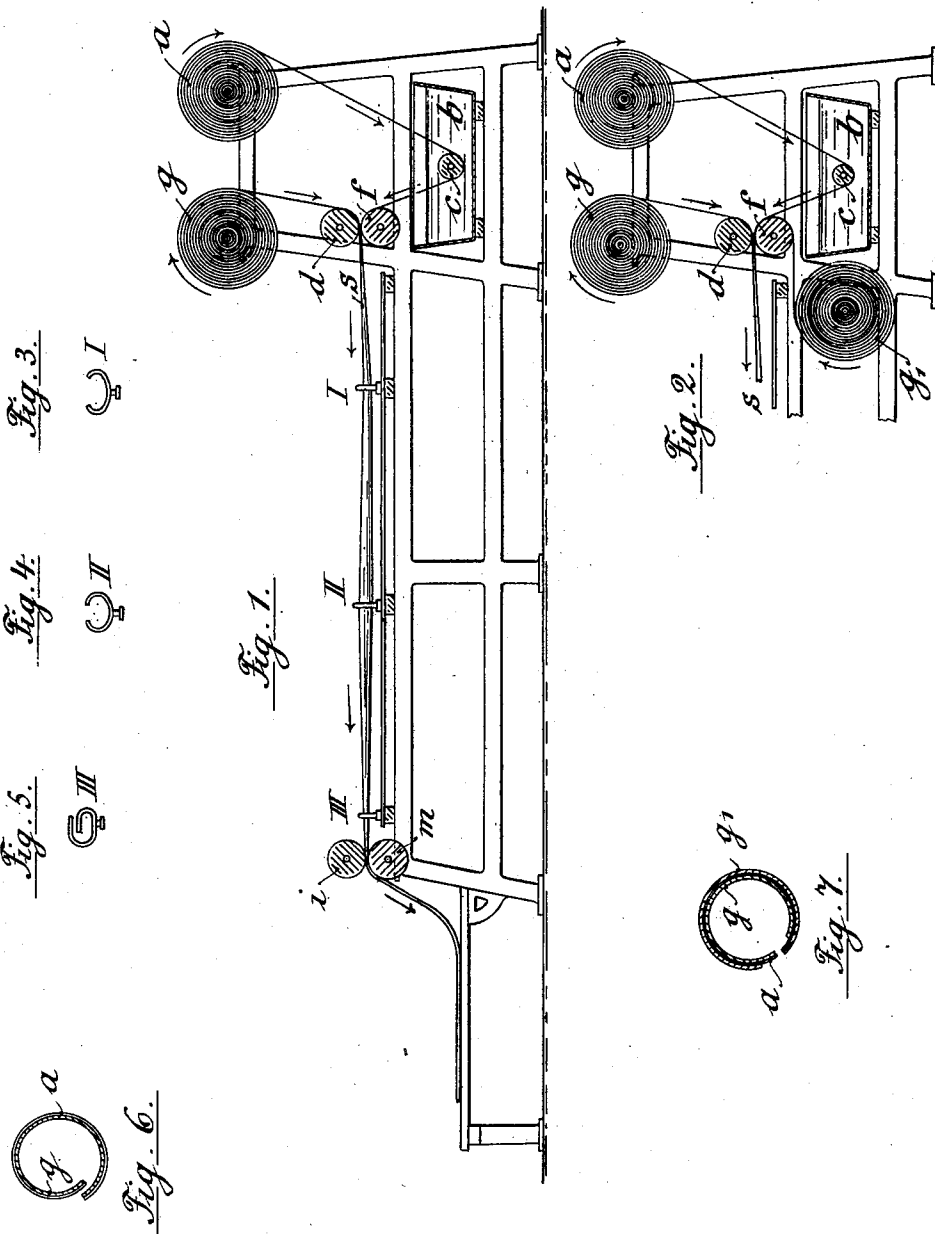
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G. H. SACHSENRODER.
PROCESS OF MANUFACTURING TUBES OF PAPER.

APPLICATION FILED AUG. 5, 1903.

NO MODEL.



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UNITED STATES PATENT OFFICE.

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PROCESS OF MANUFACTURING TUBES OF PAPER.

SPECIFICATION forming part of Letters Patent No. 747,332, dated December 15, 1903.

Original application filed January 7, 1903, Serial No. 138,152. Divided and this application filed August 5, 1903. Serial No. 168,352. (No model.)

To all whom it may concern:

Be it known that I, GUSTAV HEINRICH SACHSENRODER, a subject of the Emperor of Germany, residing at Barmen-Unterbarmen, in the Kingdom of Prussia and Empire of Germany, have invented new and useful Improvements in Processes or Methods of Manufacturing Tubes of Paper with Linings or Covers, of which the following is a specification.

This invention relates to a process of producing tubes by bending together the edges of a strip or width of paper or suitable material and providing the same during the formation with a lining or covering to strengthen the tube and add to its appearance.

According to this invention a strip of paper or material of suitable length and width is passed through an adhesive liquid and united by pressure to another strip of material intended for the lining. The compound strip so produced is then bent to form a tube in such a way that the lining comes inside and the edges of the strip overlap to the desired extent to form a joint. The overlapping edges are then pressed together, and after thorough drying the tube so obtained is cut to desired lengths. By simultaneously applying a strip on each side of the foundation or intermediate strip after passing through the adhesive solution one of the strips will form a lining and another a cover for the intermediate tube or body-strip or for the tube formed in the manner described.

In the drawings, Figure 1 represents diagrammatically in side elevation an arrangement adapted to carry the invention into effect. Fig. 2 is a side elevation of a modification of the arrangement for applying simultaneously a lining and an outer envelop. Figs. 3, 4, and 5 show the tube-formers detached. Fig. 6 is a section of a formed but unclosed tube having a lining. Fig. 7 is a section of a formed but unclosed tube provided with a lining and an outer envelop.

The strip of paper from which the lined or enveloped tube is to be formed is conveniently drawn from a roll *a*, thence through a trough *b*, containing adhesive liquid. A guide or dip

roller *c*, under which the strip passes, is mounted in the trough. Doctors' brushes or the like devices are provided to remove the superfluous liquid as it leaves the trough, whence it passes between pressing-rollers *d f*. Along with the strip from the roll *a* the lining-strip from the roll *g* passes between the pressing-rollers. Sufficient pressure or nip is applied by the pressing-rollers to firmly unite the two separate strips into a single compound strip *s*, which traveling in the direction of the arrows goes through an oval guide or former I, where the edges are turned up, then through the former II, which more nearly approaching the form of a circle bends the edges closer together. The strip then goes through the former III, which causes the edges to overlap. Figs. 3, 4, and 5 show the formers in front elevation. The strip *s* has now been bent to the shape shown in cross-section in Fig. 6, in which state it goes through a pair of pressing-rollers *i m*, where sufficient pressure is applied to unite the overlapping edges. As the tube leaves the press-rollers *i m* it is cut into convenient lengths.

To produce a tube with a lining and an outer envelop, the latter, as shown in Fig. 2, is drawn upward from the roll *g'* and passes between the pressing-rollers, under the strip coming from the roll *a*, through the adhesive liquid. At the same time the strip to form the lining comes from the roll *g*. A triple compound strip *s* is thus produced, from which the tube is formed and treated in the manner already described.

In the case of a tube having a lining and an envelop the edges of the respective strips are set in such a relation to each other (see Fig. 7) that the adhesive material at the edges *a'* effects the union of the overlapping portions.

Should it be desired not to press the tubes flat in the press-rollers *i m*, but to preserve them in a perfectly-round form when they leave the press-rollers *i m*, the strip *s* is led over a round mandrel extending from the former I, through the formers II and III, and into the pressing-rollers *i m*. The flattened tubes may, however, be transformed into

round ones by the application of internal pressure.

By the choice of suitable lining or enveloping fabrics tubes possessing a considerable
5 power of resistance to liquid or gas pressure may be obtained.

What I claim as new, and desire to secure by Letters Patent, is—

A method of manufacturing tubes from a
10 plurality of strips of suitable material, consisting in passing one of the strips through an adhesive substance for coating it, removing the surplus adhesive material, uniting the
15 other strip to said coated strip, bending the united strips longitudinally in a substantially oval-shaped manner, then bending said oval-

shaped united strips to a substantially cylindrical shape thereby bringing the longitudinal edges of said united strips closer together, then bending said substantially cylindrical-
20 shaped united strips so that their longitudinal edges will overlap, and then uniting said overlapping edges forming thereby the tube, substantially as herein set forth.

In testimony whereof I have hereunto set
25 my hand in the presence of two subscribing witnesses.

GUSTAV HEINRICH SACHSENRÜDER.

Witnesses:

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