

M. SCHUBERT.
MACHINE FOR FORMING PAPER TUBES.
APPLICATION FILED JUNE 21, 1909.

987,829.

Patented Mar. 28, 1911.

2 SHEETS—SHEET 1.

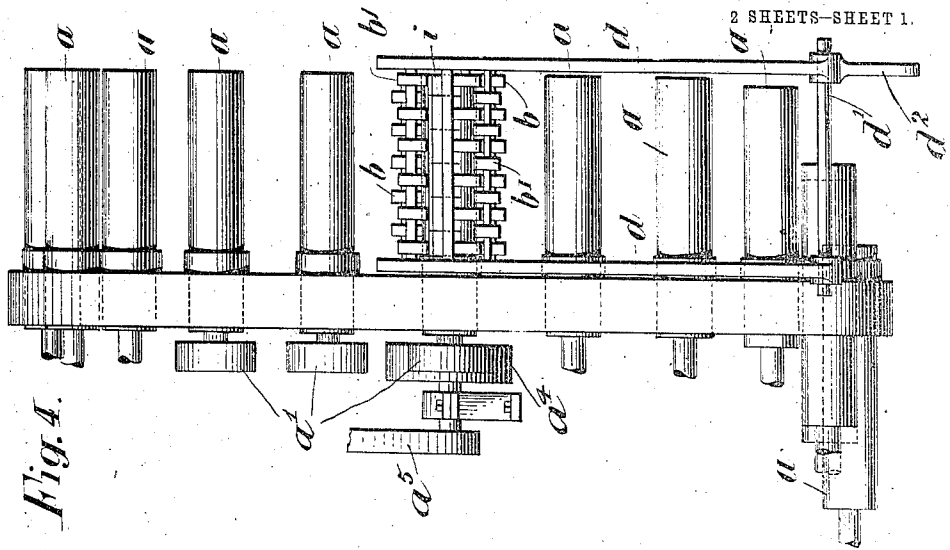


Fig. 4.

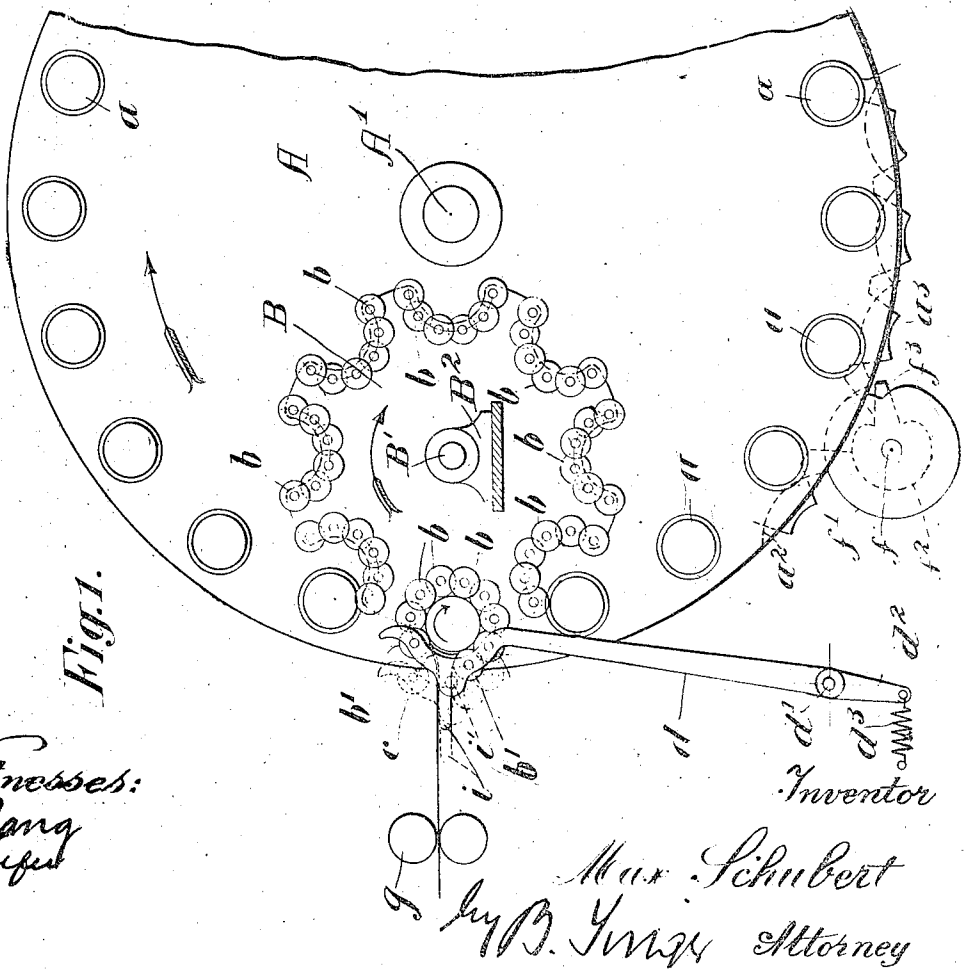


Fig. 1.

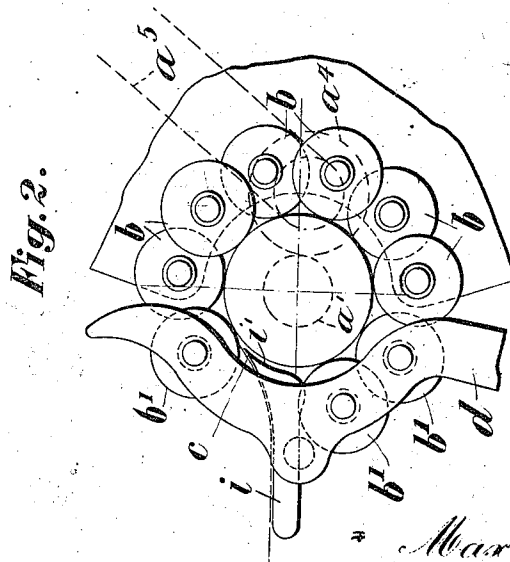
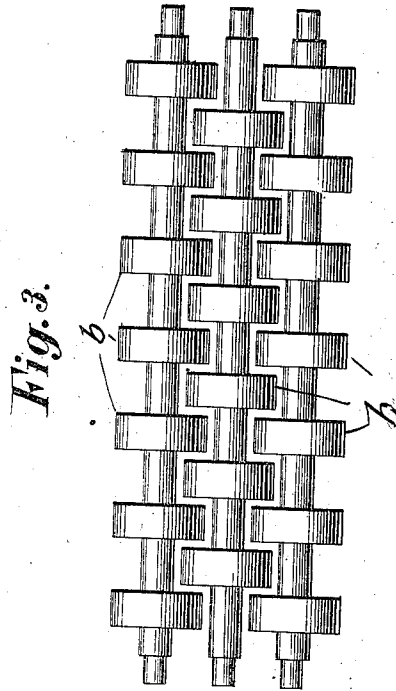
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UNITED STATES PATENT OFFICE.

MAX SCHUBERT, OF KOTTBUS, GERMANY.

MACHINE FOR FORMING PAPER TUBES.

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Specification of Letters Patent. Patented Mar. 28, 1911.

Original application filed November 11, 1908, Serial No. 462,141. Divided and this application filed June 21, 1909. Serial No. 503,454.

To all whom it may concern:

Be it known that I, MAX SCHUBERT, a subject of the German Emperor, and resident of Kottbus, Germany, have invented a certain new and useful Machine for Forming Paper Tubes, of which the following is a specification.

This invention is a part of and this application is a divisional one from my application No. 462,141, and relates to improvement for manufacturing paper or card board tubes and has to do more particularly with an improved form of mechanism for forming the tubes about a mandrel.

The invention will be more fully described in connection with the accompanying drawings and will be more particularly pointed out and ascertained in and by the appended claims.

In the drawings:—Figure 1 is a view in side elevation of a portion of a machine embodying one form of my invention. Fig. 2 is a side elevation of one of the mandrels with the tube forming mechanism in connection therewith, the same figure being on an enlarged scale. Fig. 3 is a side elevation of a portion of the tube forming mechanism. Fig. 4 is an end view of the machine shown in Fig. 1.

Like characters of reference designate similar parts throughout the different figures of the drawings.

As shown, my invention includes a rotary mandrel carrier A which is preferably in the form of a disk and is shown mounted upon a shaft A'. The shaft A' may be supported in any desired manner in suitable bearings, (not shown). The mandrel carrier or disk A is provided with a plurality of mandrels a which are rotatively mounted therein and which project laterally from one side of the disk or carrier A. The shafts of the mandrels a project through and beyond the opposite face of the disk or carrier A and each mandrel is provided with a friction wheel a'.

Suitable mechanism is provided for imparting to the carrier A a step by step movement to successively bring the mandrels a into a working position and permit the same to remain in such position until the tube is formed thereon and thereafter moving the

mandrel with its tube beyond the working position and another or empty mandrel into a working position. As the specific form of such mechanism does not constitute a special feature of my invention the same has been indicated generally in Fig. 1. A shaft f carries a double cam and may be operated by any suitable source of power (not shown). f' designates one portion of the cam which is of heart shaped formation and which may engage suitably formed recess portions a² on the carrier A. f² designates a cam portion for engagement with toothed portion a² on the carrier A. The cam portion f² is provided with a finger or actuating portion f³ adapted for engagement between the toothed portions a³ to effect movement of the carrier A in the direction of the arrow shown in Fig. 1. The cam portion f' rotating in the recess portion a² holds the carrier A in a position of rest during formation of the tube.

Means is provided for rotating the mandrels as the same are successively brought into a working position, but the specific form of such means does not constitute the feature of my invention therefore I have broadly indicated such means in a diagrammatic form. As shown in Fig. 2 a constantly rotating friction wheel a⁴ is provided and is located in a position to engage the mandrel wheels a' as the mandrels are successively brought into a working position. The wheel a⁴ may be operated continuously by a belt a⁵, diagrammatically indicated, from any suitable source of power not shown. Likewise, the means for feeding the papers to the forming mechanism is diagrammatically indicated at g and may consist of two rollers between which the paper is fed.

With the foregoing illustration of the means for feeding the paper, the means for imparting step by step rotation of the carrier and means for rotating the mandrels, it would be clearly within the province of any mechanic to provide any specific form of such means that conditions might require.

Referring now to the features which constitute my invention, in combination with the carrier A and its mandrels, I provide two sets of forming mechanisms for cooperating with the mandrels in the formation of

the tubes. On the feeding side of the mandrels and between the path of the same and the feeding device *g*, is provided a plurality of, or group of rollers *b'*, for engagement with the mandrels in forming the tubes. The rollers *b'* are mounted on arms *d* and the latter are mounted upon a shaft *d'*. One of the arms *d* is provided with an extension *d²* connected with a spring *d³* for yieldingly holding the arms in the full line position shown in Fig. 1 and permitting retraction of said arms *d* into the dotted line position shown therein. The arms *d* carry a shaft *i'* on which a plurality of arms *i* are mounted, said arms constituting a shelf or feeding surface on which the paper is fed toward the mandrel. In order that the inner ends of the arms *i* may lie as closely as possible to the mandrels they are preferably rounded as at *i²*, inwardly, as shown in Fig. 2. The shape of the upper face of the arms is such as to guide the paper toward the uppermost points of the mandrel so that it may be wound thereabout in the direction of the arrow indicated at Fig. 1. As will be readily seen by reference to Fig. 1 the mandrels themselves engage the arms *d* so as to move the same into the dotted line position during movement or transfer of one mandrel from a working position and another mandrel into a working position.

A cooperating device cooperates with the mandrels on that side opposite to the feeding side and as shown the same consists of a series or group of rollers *b*. The rollers *b*, like the rollers *b'*, are arranged in staggered or overlapping relation with respect to each other so that they engage the paper during the forming operation at closely adjacent points and so that the engagement of the forming rolls will be substantially continuous. Preferably the forming rolls *b* are mounted upon a carrier which is rotatable and which as shown is in the form of a disk *B*. As shown in Fig. 1 the disk *B* is mounted upon a shaft *B'* mounted in a fixed bearing *B²*. The bearing *B²* may be fixed to any suitable stationary part. It will be seen by reference to Fig. 1 that the rollers embrace the mandrel so that when the mandrel is moved out of the working position the carrier *B* is also moved so as to bring another set of rollers *b* into working position with the next mandrel when the same is moved into a working position. Not only does the group of forming rollers *b* engage the mandrel in the working position but the next adjacent groups also engage the next adjacent mandrels so as to insure the correct positioning of the rollers and movement of the carrier *B* when one mandrel is being moved into a working position.

The paper is fed by the feeding means

onto the shelf *i* and is guided thereby between the uppermost rollers of the arms *d* and the mandrel and is thereafter guided by the rollers *b* about the mandrel and is pressed against the mandrel so that superposed layers of paper, previously provided with any kind of adhesive material, will be formed into a compact and rigid tube.

No specific means is herein shown for removing the tubes from the mandrels after they have been formed thereon and for the purpose of the present disclosure it may be assumed that the rolls are removed by hand.

I claim—

1. A machine for forming paper tubes comprising in combination, a carrier provided with a plurality of mandrels, means for feeding the paper toward the mandrel which is in a working position, a movably mounted rotatable forming mechanism embracing one side of the mandrel in working position and provided with means for feeding and directing the paper thereon, movably mounted rotatable forming mechanism embracing the opposite side of the mandrel in working position, said mechanisms being arranged for movement by the mandrel out of a working position, means for rotating the mandrel when in a working position, and means for actuating the carrier to move the working mandrel out of a working position.

2. A machine for forming paper tubes comprising in combination, a carrier provided with a plurality of mandrels, means for feeding the paper toward the mandrel in working position, a pivotally mounted rotatable forming mechanism embracing the mandrel in working position on one side and provided with means for receiving the paper and directing the same onto the mandrel, rotatably mounted rotating mechanism embracing the working mandrel on the other side, both of said mechanisms being arranged for movement by the working mandrel out of a working position, means for rotating the working mandrel, and means for imparting a step by step movement to said carrier to successively bring the mandrel into and out of a working position.

3. A machine for forming paper tubes comprising in combination, a rotatable carrier provided with a plurality of mandrels, means for feeding the paper toward the mandrel in a working position, rotatable forming mechanism comprising a plurality of rollers adapted to embrace one side of the mandrel in working position, means for holding said mechanism into engagement with the mandrel in working position, a rotatable forming carrier provided with a plurality of groups of rollers for embracing the opposite side of the mandrel in working

position, said carrier being arranged for movement by said mandrels, and means for rotating the mandrel which is in working position, and means for imparting to said
5 mandrel carrier a step by step rotative movement to successively bring the mandrels into a working position.

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

MAX SCHUBERT.

Witnesses:

WOLDEMAR HAUPT,
HENRY HASPER.