

No. 789,707.

PATENTED MAY 16, 1905.

C. J. BELLAMY.

METHOD OF FORMING ROLLS OF SHEETS OF PAPER OR OTHER FLEXIBLE MATERIAL.

APPLICATION FILED FEB. 27, 1904.

2 SHEETS—SHEET 1.

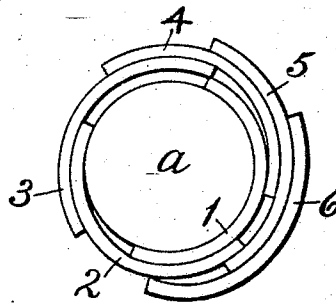


FIG. 1.

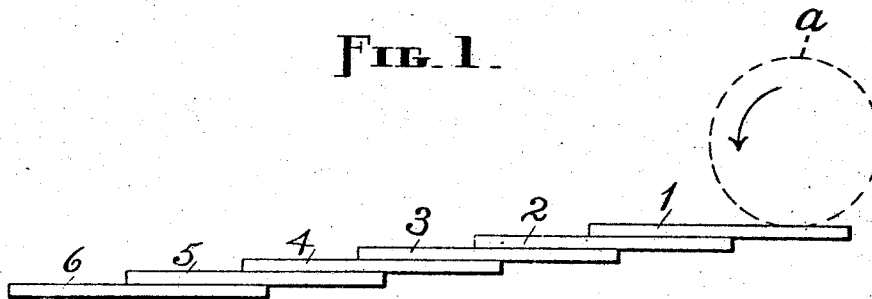


FIG. 2.

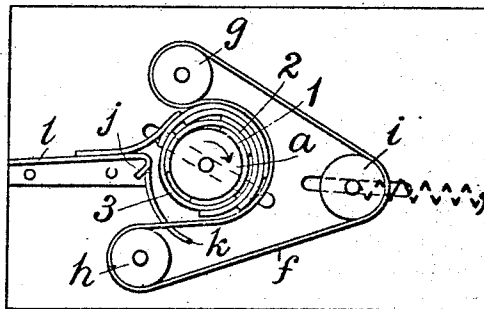


FIG. 3.

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2 SHEETS—SHEET 2.

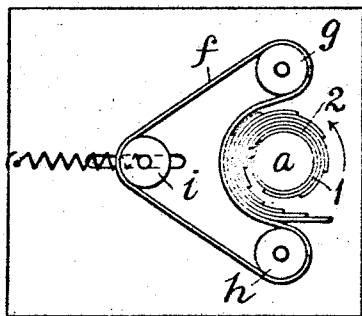


FIG. 4.

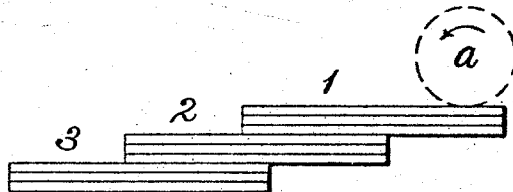


FIG. 5.

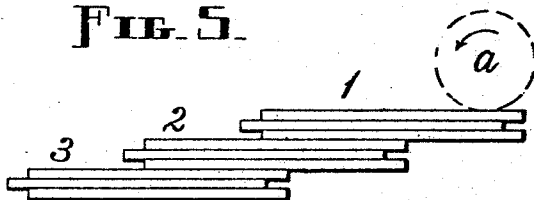


FIG. 6.

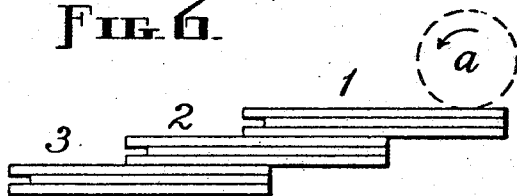


FIG. 7.

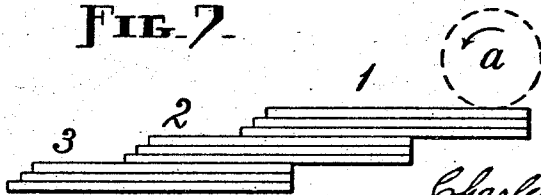


FIG. 8.

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UNITED STATES PATENT OFFICE.

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METHOD OF FORMING ROLLS OF SHEETS OF PAPER OR OTHER FLEXIBLE MATERIAL.

SPECIFICATION forming part of Letters Patent No. 789,707, dated May 16, 1905.

Application filed February 27, 1904. Serial No. 195,555.

To all whom it may concern:

Be it known that I, CHARLES J. BELLAMY, a citizen of the United States of America, residing in Springfield, in the county of Hampden and Commonwealth of Massachusetts, have invented new and useful Improvements in Methods of Forming Rolls of Sheets of Paper or other Flexible Material, of which the following is a specification, reference being had to the accompanying drawings and characters of reference marked thereon.

Various efforts have been made to put up packages of sheets of flexible material, especially paper, so that one sheet at a time may be detached. In no case, however, has a method been provided for forming a package or roll in detachments having no connecting means, so that one sheet at a time or two or more, as predetermined, may be detached at one operation or pull.

The object of my invention is to provide a method by which such flexible material may be formed into a roll in detachments, so that succeeding detachments are wrapped upon preceding detachments in such sequence and relation each to the others that when it is desired to feed the detachments one at a time in substantially the order and relation in which they were wound into the roll it may be readily done. I accomplish the objects of my invention by the method herein described.

By the term "detachment" as herein employed it is to be understood that it refers to either one or more sheets of flexible material, so that a "detachment" as the term is herein employed may comprise one sheet, two, three, or more sheets.

In the drawings I illustrate on a greatly-enlarged scale a package of paper formed according to my invention and also illustrate a method of forming such a package into a roll and also means for supporting such roll so that detachments may be taken from said roll one at a time in substantially the same order and relation in which they were wound, showing in each instance a portion of the next presenting detachment in position to be readily grasped.

In the drawings, Figure 1 illustrates said roll, showing said detachments of paper on a greatly-enlarged scale in thickness, *a* indicating a core, and 1 2 3 4, &c., indicating detachments of paper occupying their relative position when in the roll. Fig. 2 is an edge view of several of said detachments, illustrating the relative positions occupied by them provided they were unrolled in a flat formation and occupied an extended position. Fig. 3 illustrates a simple apparatus adapted to carry out the method of forming the roll so as to insure the independent feeding of each detachment in substantially the order and relation to other detachments in which they were wound, showing a portion of each succeeding detachment presented in a position so that it may be easily grasped after its predecessor has been fed off. Fig. 4 illustrates a simple apparatus adapted to support the roll. Figs. 5, 6, 7, and 8 illustrate different methods of making up detachments as wound on or fed off from my roll.

In describing my roll it should be understood that by the term "rear" as applied to a sheet or detachment I desire to designate the end thereof last to be wound upon and first to be fed from the roll and that by the term "lapping" as applied to the relative positions of detachments I mean to indicate that one of them rides upon the surface of the other. By the terms "inner" and "outer" or "outside" I mean to designate, respectively, a position toward the core or away from the core. By the terms "preceding" and "succeeding" as applied to sheets and detachments I mean to designate the respective orders of the same in their course in being wound into the roll.

A detachment may obviously consist of a single sheet, as illustrated in Figs. 1, 2, 3, and 4, and a roll may be made up of a succession of detachments each made up of but a single sheet, so such sheets may be of irregular lengths or have varied laps and projections to the rear of each succeeding sheet in relation to the next preceding sheet, or the detachments may also comprise an additional sheet or any number of additional sheets superim-

posed upon the inner sheet, which inner sheet laps upon the outside of the next preceding detachment and the rear of which said inner sheet projects to the rear of said preceding detachment, as illustrated in Fig. 5.

Fig. 6 illustrates the make-up of a detachment the outer and inner sheets of which are approximately even with each other at front and rear, but between which is supported a sheet the front end of which does not extend so far and whose rear end extends farther than the said supporting-sheets of the detachment.

Fig. 7 illustrates a detachment in which the middle sheet is shorter than the inner and outer supporting or what might perhaps be called the "binding" sheets of the detachment, its rear end falling short of the rear ends of said supporting-sheets.

Fig. 8 illustrates the make-up of a detachment comprising three sheets each of different length, the rear ends not being parallel.

Other make-ups for the detachments may be easily imagined which would be practical in roll formations coming within the scope of my invention, different varieties of detachments being especially useful for diverse purposes.

The method in which the detachments are wrapped, each succeeding detachment lapping upon the outside of the next preceding and its rear projecting to the rear of the same preceding detachment, will be understood if we suppose the core placed upon the detachment as indicated in Fig. 2 and rolled toward the opposite end of the procession of lapping detachments, the detachments being rolled or wound upon the core as the latter is rolled along toward the said opposite end of the procession of detachments. Then it will be observed that each successive detachment of flexible material will lap upon the outside of the one next preceding it in order, and the rear end of the said succeeding detachment will project to the rear of the said next preceding detachment. When such a roll is placed in a suitable apparatus, such as is shown in Fig. 4, duly supporting the same, while allowing it to rotate as required to feed the successive detachments, they will be presented and delivered as said roll is caused to revolve one at a time and in predetermined order and the relative position of lap and rear end projection which they took in winding. A simple apparatus for forming such rolls is illustrated in Fig. 3, comprising endless tapes *f*, supported by rollers *g*, *h*, and *i*, one of which rollers, by preference the latter, is held in yielding bearings, so as to permit the endless tapes *f* to continually hold in partial embrace a roll of varying size mounted in movable bearings. The core *a* of the roll is revolved by any convenient means in the direction in-

dicated, and the detachments of flexible material are presented thereto and to the increasing roll of material being wound thereon so as to catch in the bite of the tapes at predetermined intervals, according to the intervals which are required in the feed, but always taking care that each succeeding detachment shall lap upon the outside of and that its rear end shall project to the rear of the next preceding detachment. The fingers *j* and *k*, short and long, and the guide *l* assist in the formation of the roll.

In Fig. 4 is shown a simple apparatus which may be used as a holder for my roll formed as above indicated, the apparatus shown being much like that illustrated in Fig. 3 except that the fingers and the guide are omitted. In feeding the roll is caused to revolve in the reverse direction to that which it takes in winding either by pulling upon the successively - exposed ends of the detachments or by rotating the roll directly, or both. Thus the rear end of each detachment is successively brought out free of the bite of the tapes in substantially the order and the relative position which they took in winding, the end of no other detachment being presented until in its due turn, detachment following detachment in due order and relative position until the supply previously wound on the core is exhausted.

Having therefore described my invention, what I claim is—

1. The method of forming a roll of flexible material in separate detachments which comprises the propelling of each succeeding detachment upon the exterior surface of the next preceding, before the latter is fully rolled, so that each succeeding detachment laps upon the rear edge of the next preceding, and causing said detachments to assume curvilinear form.

2. The method of forming a roll of flexible fabric in separate detachments, consisting in causing an endless belt to travel under tension around a supporting member, and in impelling into the bite formed between the traveling belt and the supporting member one such detachment after another, each succeeding detachment lapping on that surface of the preceding which is adapted to be an exterior surface when caused to assume curvilinear form.

3. A method of forming a compact roll of separate detachments of flexible material, consisting in feeding to a core partially inclosed by one or more tapes, a series of such detachments in such a manner that the forward edge of the succeeding detachment overlaps the rear edge of the preceding detachment thereby coming between it and the tape or tapes.

4. The method of forming a roll of sepa-

rate detachments of flexible material which
comprises the propelling of such detach-
ments *seriatim* upon a revolving member,
one following another before the preceding
5 is fully rolled, so that each succeeding de-
tachment laps upon the rear edge of the next
preceding.

In testimony whereof I have hereto sub-
scribed my name in the presence of two sub-
scribing witnesses.

CHARLES J. BELLAMY.

Witnesses:

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A. L. STEVENS.