May 12, 1925. 1,537,402

J. BOTTENBERG

BEATER DEVICE FOR BRAIDING MACHINES

Filed Nov. 17, 1922 2 Sheets-Sheet 1

Fig. 1

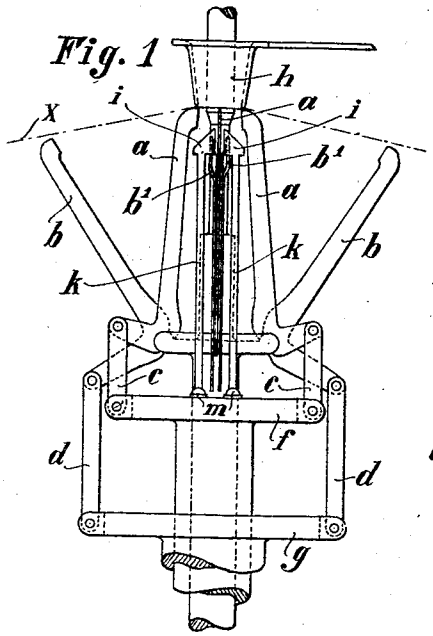

Fig. 2

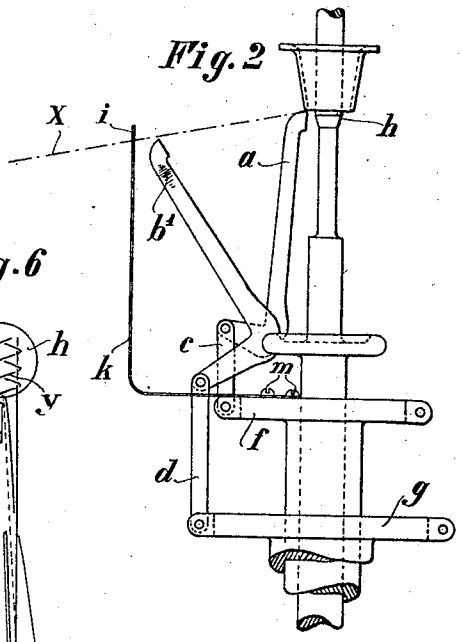

Fig. 6

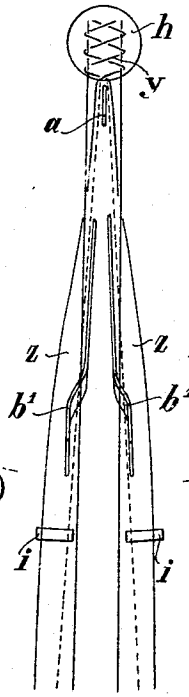

Fig. 3

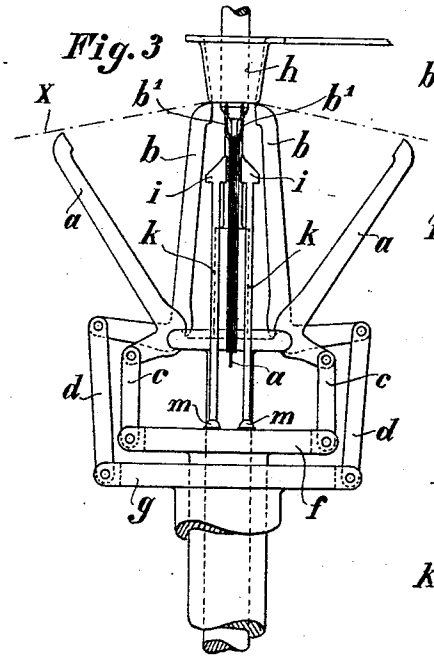

Fig. 4

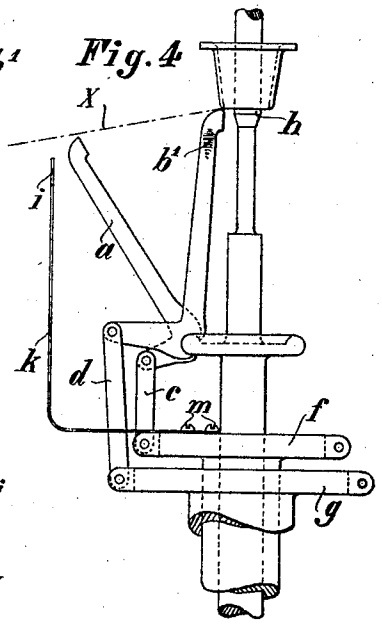

Fig. 5

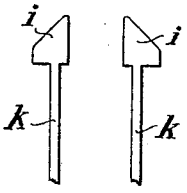

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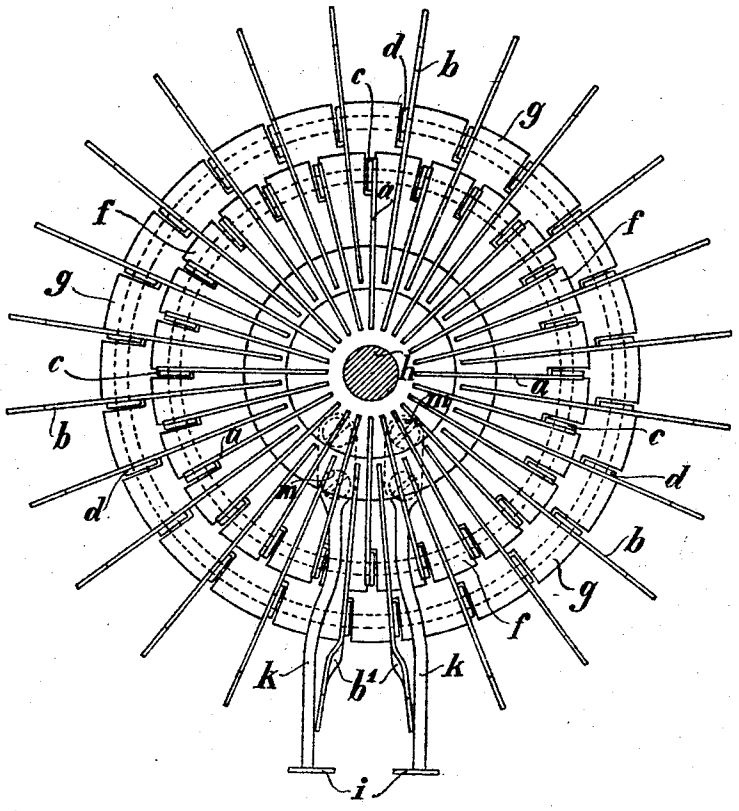
Fig. 7



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Patented May 12, 1925. 1,537,402

UNITED STATES PATENT OFFICE.

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BEATER DEVICE FOR BRAIDING MACHINES.

Application filed November 17, 1922. Serial No. 601,628.

To all whom it may concern:

Be it known that I, JULIUS BOTTENBERG, a citizen of Germany, residing at Barmen, Germany, have invented certain new and useful Improvements in a Beater Device for Braiding Machines, of which the following is a specification.

My invention refers broadly to means for making laces, particularly such as may be obtained by the so-called single-thread lace braiding or plaiting machine, that is a machine of the type described for instance in U. S. Letters Patent to Malhère No. 613380, and it is intended to materially increase the adaptability of machines of this kind.

In the manufacture of laces with comparatively broad braided portions (spots, leaflets and the like) by means of a machine of the type aforesaid, it is old to effect the beating of the marginal thread crossings of the threads of the portions which shall be kept broader by means of a pair of outwardly cranked beater arms, with a view of obtaining spots, leaflets and the like of the greatest possible width. This procedure, however, involves the difficulty that the laterally cranked beater arms cannot reliably engage the thread crossings to be beaten whereby the extent of the cranked portion of the beater arms, and consequently the width of the spots or the like, are considerably limited.

In the device according to the present invention, this difficulty is overcome in that before the beating of the marginal thread crossings of the threads of the portions to be broadened the outer thread in each of the two pairs of threads forming these crossings is shifted outwards by means of a wedge-like operating member moved into the cone of threads. By this means the cranked beaters are enabled to reliably engage the crossings to be beaten and, on the other hand, it is now possible to extend the cranked portion of the beaters considerably beyond the ordinary, and thereby to obtain a substantially increased width of the spots and the like, as compared with the previous state of the art.

For the purpose of carrying the new process into effect, an ordinary crown beater with two alternatingly movable groups of beater arms is employed which, in a well known manner, are flexible in the lateral direction so that, in accordance with the particular position of the spots and the like in the fabric to be produced, any pair of beater arms may be cranked outwards in any of the groups. In connection therewith and in accordance with my invention, there are arranged at the rear of the cranked beater arms of one of the groups and in the radial direction wedge-like members arranged for reciprocation together with the other group of beater arms, and in such a manner that, when the wedges are raised, they engage between the pairs of threads to be beaten by the cranked beater arms and in doing so shift the outer thread in each of these pairs of threads a comparatively great distance from its normal position outwards. These wedges are fastened to the corresponding lifting disc by means of flexible bars so as to be easily detachable, and in a manner to both allow of being exactly adjusted by merely bending their supporting rods, and of being adapted to be secured at any suitable point of the lace corresponding to the position of the portions which shall be kept broad.

The invention will be more fully described with reference to the accompanying drawing, showing in Figures 1 to 5 an embodiment of the principles thereof by way of example as applied to a crown beater, only part of the beater arms, the number of which as usual corresponds to the number of discs of the braiding or plaiting machine, being shown for the sake of clearness of illustration.

In Figures 1 and 2, I have shown two views in elevations of the crown beater at right angle to each other, the group of beater arms containing the cranked pair of beaters, being shown in the lower terminal position.

Figures 3 and 4 are similar views in elevation with the group of beater arms containing the pair of cranked beaters shown in the operating position.

In Figure 5 I have shown the two wedge members in detail.

Figure 6 is an illustration of the mode of operation of the device according to this invention in top plan view with the braided fabric in the plane of the paper.

Figure 7 is a plan view of the device.

Referring to the drawings, the crown beater is provided in the usual manner with two groups of rockingly arranged beater arms *a*, *a* and *b*, *b*, respectively, which are

alternatingly upwardly rocked by the oppositely moved lifting rings *g* and through the medium of the rods *c*, *d*, so as to be beaten. During the movement the beater arms, as is well known, enter in radial direction behind the thread crossings of threads and into the cone *x* formed by the threads, thereby pushing the thread crossings towards the mandrel *h*. In order to retain the thread crossings, the beater arms which happen to be in beating position, are rocked downwards only after the beater arms of the other group have gone through the beating operation. All beater arms are made of comparatively thin flexible sheet metal, so that they may be exactly adjusted by lateral bending and, if desired, may be laterally cranked away from each other.

At the points in which a broadened pattern, a spot for instance, shall be formed in the lace to be manufactured, two adjacent beater arms of one group, for instance the two beater arms b^1, b^1 are cranked apart with the well known result that the marginal points of intersection of the spot are beaten at a greater distance from the median line of the spot, than is normally the case, by which means the desired width of the spot is produced. In order that the cranked beater arms can reliably engage the thread crossings to be beaten, I provide to the rear of each beater b^1, b^1 outwardly sloping wedges *i*, *i*, carried by rods *k*, *k* which are secured to the lifting disc *f* of the group *a*, *a* of beater arms, so that the two wedges *i*, *i* are raised and lowered in positive synchronism with the beater arms *a*, *a*, that is to say, upon the upward rocking movement of the said beater arms, they enter from below the cone of threads *x*. The wedges are arranged in such a position with relation to the cranked beater arms b^1, b^1, that the threads *z*, *z* which happen to be the outer threads of the pairs of threads forming the thread crossings to be beaten by the beater arms b^1, b^1 are thereby shifted a comparatively large distance outwards from their normal position. By this means, as appears from Figure 6, the result is accomplished that the cranked beater arms b^1, b^1 reliably engage with the thread crossings, so that all thread crossings are carefully beaten and undesired holes in the lace are avoided.

Inasmuch as the position of the portion to be broadened in the lace usually varies with each lace, the rods *k*, *k* carrying the wedges *i*, *i* are detachably secured to the lifting disc *c* by means of screws *m*, *m* or the like, so that they may be secured at any desired point, that is to say, they may be mounted wherever a pair of beater arms has to be cranked apart for the purpose of broadening portions of the lace. The rods are, moreover, also readily flexible, so that the wedges *i*, *i* can be exactly adjusted by bending the rods *k*, *k* laterally.

Evidently, a pair of beater arms of the group of beater arms *a*, *a* might also be cranked asunder in which case the rods carrying the wedges *i*, *i* will have to be secured to the lifting disc *g* of the group of beater arms *b*, *b*. Also several pairs of beater arms may be cranked asunder, wherever the nature of the pattern of the lace requires it, and in such case the number of wedges *i*, *i*, will, of course, have to be increased correspondingly.

Other alterations and modifications will suggest themselves to the expert to adapt the invention to varying conditions of its application and within the spirit and scope of the principles of the invention.

I claim:—

1. Single-thread lace braiding or plaiting machine comprising in combination, two groups of alternately movable, laterally flexible thread beater arms, pairs of such beater arms being cranked outwards and vertically reciprocable wedges arranged radially to the rear of the cranked beater arms of the one group and connected with the beater arms of the other group.

2. Single-thread lace braiding or plaiting machine comprising in combination, two groups of alternately movable, laterally flexible beater arms, pairs of such beater arms being cranked outwards, vertically reciprocable rings for alternately moving the two groups of beater arms, pairs of vertically reciprocable wedges arranged radially to the rear of the cranked beater arms of one group of beater arms and flexible rods carrying said wedges and removably fixed to the reciprocable ring belonging to the other group of beater arms.

3. Single-thread lace braiding or plaiting machine comprising in combination, two groups of alternately movable, laterally flexible thread beater arms, vertically reciprocable rings for alternately moving the two groups of beater arms, vertically reciprocable wedges arranged in pairs and adapted, on being raised, to enter between the threads of certain pairs of threads behind the thread crossings formed by these pairs and flexible rods carrying said wedges and removably connected to said rings.

In testimony whereof I affix my signature.

JULIUS BOTTENBERG.