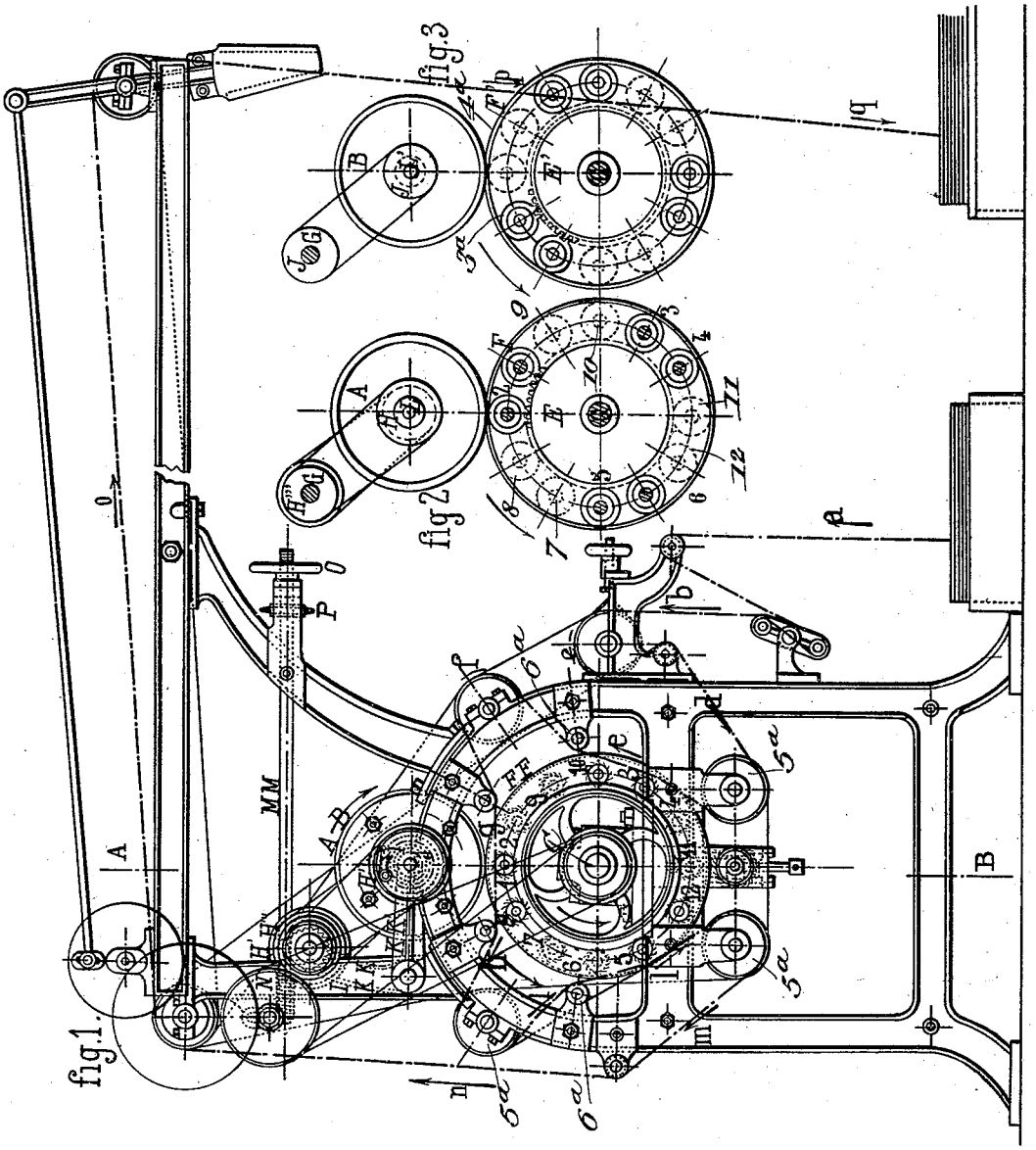
(No Model.) 2 Sheets—Sheet 1.

G. & H. BAUCHE.

CLOTH NAPPING MACHINE.

No. 494,052. Patented Mar. 21, 1893.



Witnesses
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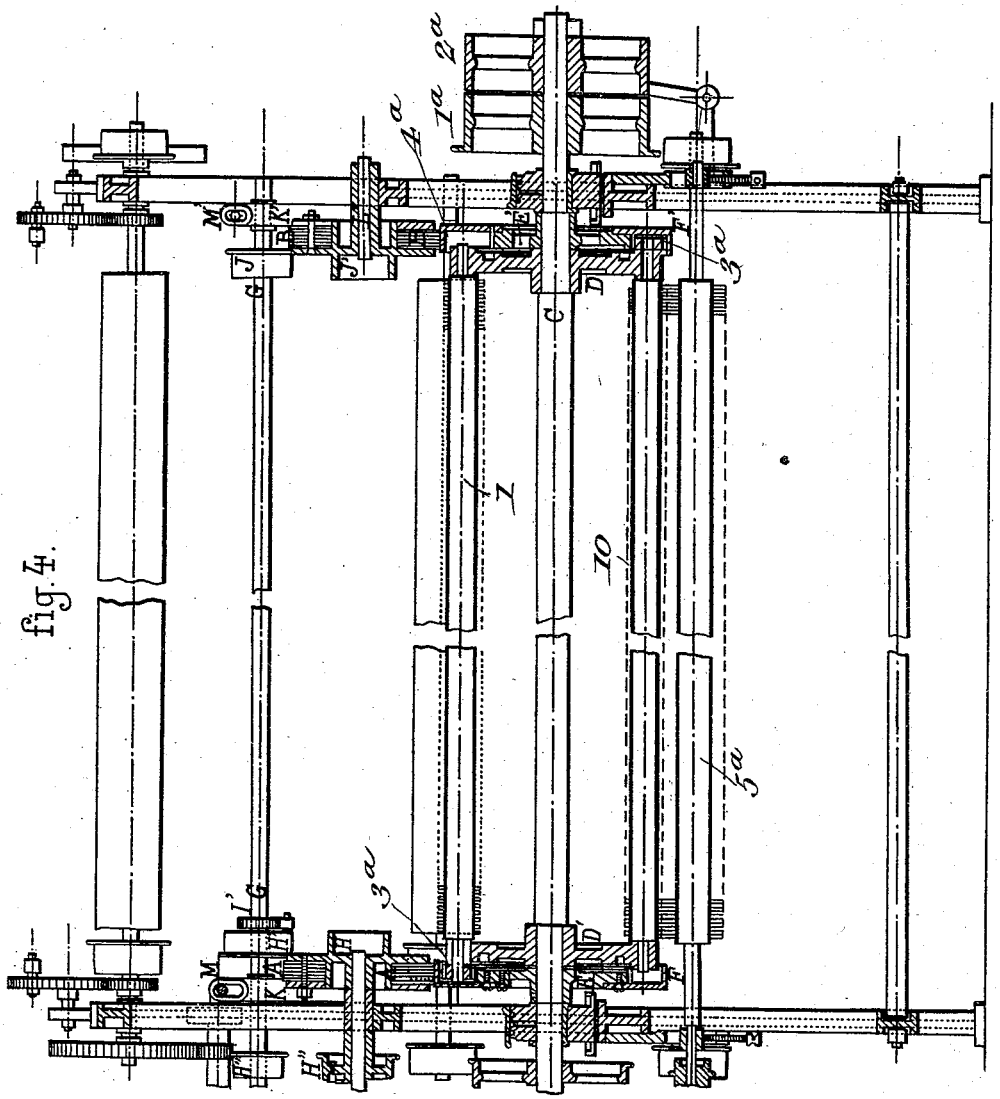

fig. 4.

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UNITED STATES PATENT OFFICE.

GUSTAVE BAUCHE AND HENRI BAUCHE, OF PARIS, FRANCE.

CLOTH-NAPPING MACHINE.

SPECIFICATION forming part of Letters Patent No. 494,052, dated March 21, 1893.

Application filed August 13, 1892. Serial No. 443,011. (No model.)

To all whom it may concern:

Be it known that we, GUSTAVE BAUCHE and HENRI BAUCHE, citizens of France, residing at Paris, in the Department of the Seine, France, have invented a new and useful Improvement in Cloth-Napping Machines, of which the following is a specification.

Our invention relates to that class of mechanism employed in forming a nap upon woolen fabrics, and the purpose of said invention is to provide simple, and efficient means whereby this nap may be produced through the action of what may be termed metallic teasels.

The invention consists to this end in a novel construction and combination of mechanical parts by which the relative action of the fabric and of the metallic teasels is produced under conditions of the most favorable character, resulting in the production of a uniform nap of any desired length and strength throughout every part of the surface of said fabric.

It is, also, one purpose of our invention to provide means whereby the length and depth of the nap may be regulated wholly by frictional devices and to so organize the mechanical parts that the napping mechanism shall receive its rotative movement from the travel of the fabric itself.

In order that our invention may be clearly understood by those skilled in the art, we will now proceed to describe the same in all its details, reference being made to the accompanying drawings, in which—

Figure 1, is an end elevation of a machine embodying our invention. Figs. 2, and 3, are diagrams illustrating the means whereby operative movement is imparted to the nap-producing members or teasel-cylinders; and Fig. 4, is a vertical section of the machine in the line A—B, Fig. 1.

Referring to said drawings, upon the shaft C is keyed a pulley which is belted in any suitable manner to a source of power, said shaft being usually provided with two pulleys, 1^a and 2^a one of which is loose and the other tight, or keyed upon said shaft in the ordinary manner. Rigidly mounted upon said shaft are two disks D, D′ which form the support for twelve teasel-cylinders of metal, which are designated in the drawings by the numerals 1 to 12, inclusive. These numerals are placed in the order of succession indicated in Fig. 1, that is to say, in the order in which said numerals read, 1, 2, 9, 10, 3, 4, 11, 12, 6, 5, 7, 8. The two disks D D′ derive their rotary movement from the shaft C and the teasel-cylinders carried by these disks are thus caused to partake of a double movement, one movement being that of translation, or in other words the movement which is given by the revolution upon their axes of the disks D D′, and a second movement which consists of the rotary movement of said teasel-cylinders upon their own axes. The six teasel-cylinders designated by the numerals 1 to 6, inclusive, are geared at the left hand of Fig. 4, by means of small gears or pinions 3^a upon their ends which mesh with a gear E, also shown in Fig. 2. The six remaining teasel-cylinders designated by the numerals 7 to 12, inclusive, are geared at the right hand of said Fig. 4, with a gear E′ having the same number of teeth as the gear E (see Figs. 3 and 4). The two gears E and E′ are loose upon the shaft C and two pulley disks or plates F and F′ are keyed upon these gears E and E′. The twelve metallic teasel-cylinders turn upon their own axes whenever they are in contact with the fabric upon which the nap is to be formed, the movement of which provokes, by its tangential engagement, the axial revolution of these teasel-cylinders. The points of contact of said tissues or fabrics with said teasel-cylinders are so arranged upon the machine that, when in operation, there shall always be six teasel-cylinders, viz., those denoted by the figures 1, 2, 3, 4, 5, and 6, in Figs. 1 and 2 in contact, and six denoted by the figures 7, 8, 9, 10, 11, 12 out of contact with said tissue, the purpose being that the six teasel-cylinders which gear upon the left hand of Fig. 4 and which are in tangential contact with the tissue, shall derive their positive rotation from the fabric and shall transmit the same with diminished power to those teasel-cylin-

ders which are geared at the right hand of Fig. 4, and which are out of contact with the fabric.

The contrary effect is produced to that described above whenever the teasel-cylinders which are geared upon the right of Fig. 4 of the drawings, and which are designated by the numerals 7 to 12 inclusive, make contact with the fabric and receive their positive revolution therefrom, transmitting the same with whatever degree of diminution in power may be produced by friction or other causes to the teasel-cylinders geared at the left of said figure, and designated by the numerals 1 to 6 inclusive, the latter teasels being out of operative contact with the fabric. The particular functional advantages residing in these teasel-cylinders and their capacity of variable power depend upon the following points: Those teasel-cylinders geared at the left of Fig. 4 and designated by the numerals 1 to 6, inclusive, being in contact, tangentially, with the fabric to be napped, receive their positive rotation from the movement of the fabric and become themselves drivers, or parts from which motion is directly communicated. Said teasel-cylinders transmit movement to the gear E which is loose upon the shaft C, but which forms part of the pulley-disk or plate F. This pulley-disk, pressed by a friction-gear A, communicates rotary movement to a shaft G, by means of pulleys H and H′ which are of different diameters, one of which is provided with a click-pawl and ratchet I′, keyed upon said shaft G, the pulleys H′ being movable on said shaft. The shaft G transmits its movement of rotation to the gear E′, which is also loose upon the shaft C but forms part of the pulley-disk F′. This movement is accomplished by means of the two belt-pulleys J and J′ which are of the same diameter and the friction-pulley B, which is held with a suitable pressure against a friction-face 4^a upon the pulley-disk T′. The teasel-cylinders indicated by the numerals 7 to 12, and gearing at the right hand of Fig. 4, being in mesh with the gear E′, are thus caused to have a variable movement, as compared with those teasel-cylinders which have their gear connections at the left of Fig. 4, and are shown by the numerals 1 to 6 inclusive.

Whenever the teasel-cylinders having their gear connections at the right hand and designated by the numerals 7 to 12, inclusive, come in contact with the fabric, they receive positive movement direct and become in their turn transmitters of motion, their rotary movement being thus imparted to the gear E which is loose upon the shaft C, but forms part of the pulley plate or pulley-disk F. This pulley-disk, pressed by the friction-gear G, imparts movement to the shaft G by way of the pulleys J and J′, which are equal in their diameter. The shaft G gives a variable movement to the friction-gear A by means of the two pulleys H‴ H″, which are of different diameters, and by the ratchet and click-pawl I, fixed upon the axis L of the friction-gear A. This friction-gear bears with its working face upon the pulley-disk F, forming a body-portion of the gear E, which is provided with one hundred teeth, and is movable upon the shaft C, its teeth having their engagement with those pinions upon the teasel-cylinders which gear at the left hand of Fig. 4 and which are between the points of contact with the tissue as shown in the drawings. This arrangement gives to these teasel-cylinders a movement which is different from the movement imparted to the remaining members of the series which are designated by the numerals 7 to 12 inclusive.

The resistance of the teasel-cylinders and the variable length and depth of the nap formed upon the fabric are controlled by the pressure of shipping levers K, K′ mounted upon fulcrums L and L′, respectively, upon which levers are mounted the friction-gears A, B, respectively, which have a frictional bearing upon the two disks F and F′. The operative contact of these frictional devices is controlled at will by means of movable key bolts M, M′ each one carrying a spring N, which has bearing against one of the shipping levers K, K′.

The action of the parts last described is controlled by the adjustment of a small hand-wheel O, having a female thread which receives the male thread formed upon the end of the key-bolt M, or M′, described above, there being one of said hand-wheels and key-bolts to each of said levers and the two together furnishing independent means whereby any desired adjustment may be given, as circumstances may require.

In this description we have given no explanation and paid no attention to those details of mechanical parts whereby the travel of the fabric and woolen goods is provided for, as these are taken from and received on any suitable form of rolls or large pulleys 5^a and guide rolls 6^a made of wood or any other suitable material, and which are so similar to those already used in napping-machines that they require no special description.

Having thus described our invention, what we claim is—

In a napping machine, the combination with a shaft, of two spur-gears loose thereon and having a different number of teeth, a series of teasel-cylinders arranged concentrically with relation to said shaft, each alternate pair having pinions at one end gearing with one of said spur-gears, and the remaining pairs being geared in like manner to the other spur-gear, a series of rolls and guide-rolls whereby the fabric is brought into contact with one of the series of pairs, means for feeding the fabric to impart revolution to

the said pairs of teasel-cylinders, a pulley-disk forming part of the spur-gear meshing with pinions on the said cylinders, a friction-disk operated by the pulley-disk, and a second friction-disk and pulley-disk to transmit the movement to the other spur-gear and impart rotary movement at a different speed to the remaining pairs of teasel-cylinders, substantially as described.

In testimony whereof we have signed this specification in the presence of two subscribing witnesses.

GUSTAVE BAUCHE.
HENRI BAUCHE.

Witnesses:
T. V. YONG,
G. DELOM.