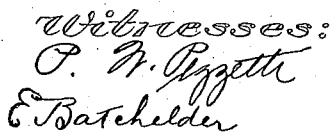


1,041,201.

2 SHEETS--SHEET 1.



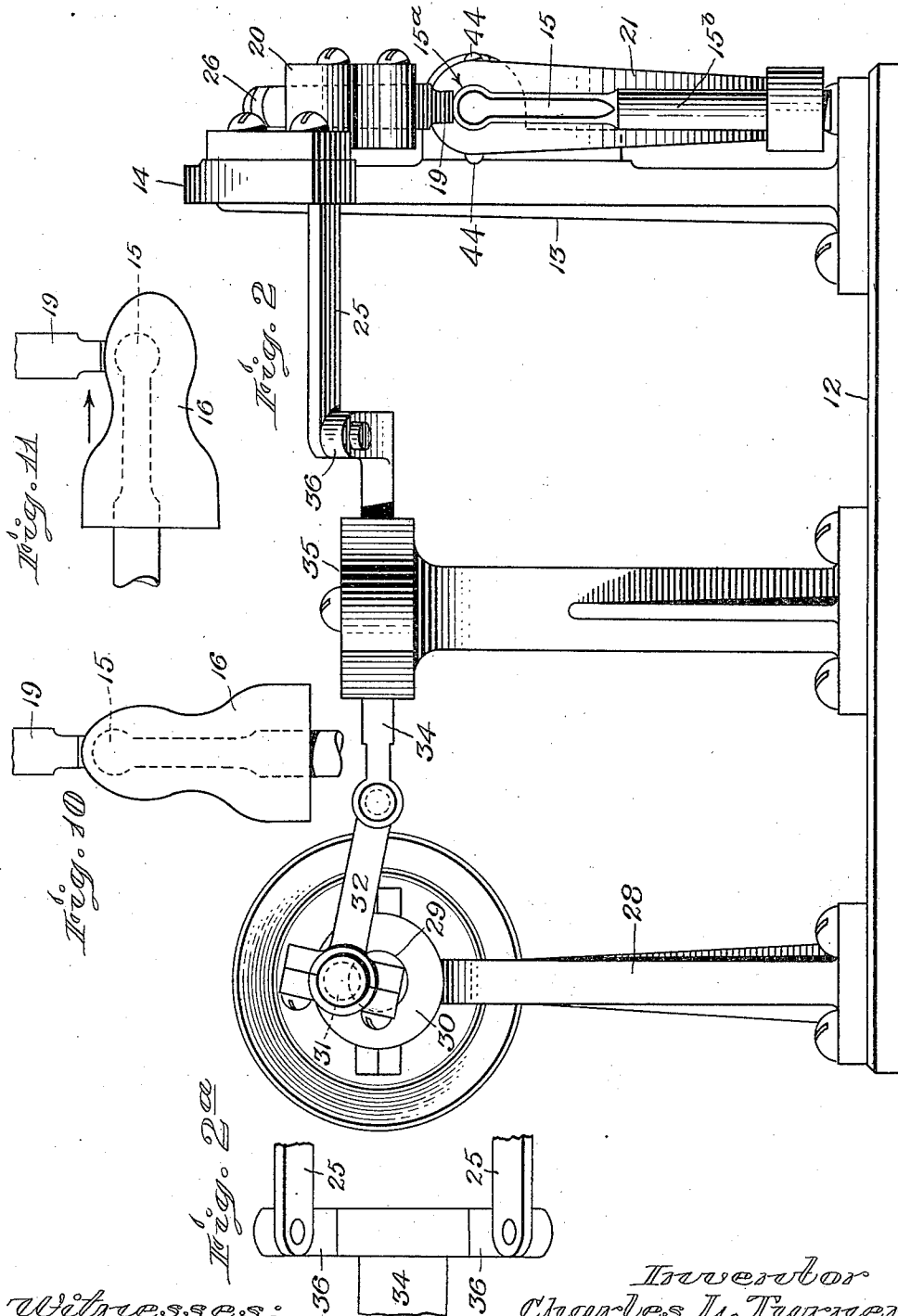
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C. L. TURNER.
 BUTT SEAMING MACHINE.
 APPLICATION FILED MAY 21, 1912.

1,041,201.

Patented Oct. 15, 1912.

2 SHEETS-SHEET 2.



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UNITED STATES PATENT OFFICE.

CHARLES L. TURNER, OF WILMINGTON, MASSACHUSETTS.

BUTT-SEAMING MACHINE.

1,041,201.

Specification of Letters Patent.

Patented Oct. 15, 1912.

Application filed May 21, 1912. Serial No. 698,850.

To all whom it may concern:

Be it known that I, CHARLES L. TURNER, a citizen of the United States, residing at Wilmington, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Butt-Seaming Machines, of which the following is a specification.

This invention relates to machines for pressing together the opposed edges of two pieces of unvulcanized rubber to cause a close contact between said edges preparatory to the process of vulcanizing the rubber and permanently uniting the contacting edges.

The invention is embodied in a machine for pressing together or butt-seaming the edges of the two unvulcanized rubber blanks which form a nursing-bottle nipple, although the machine may be adapted for butt-seaming the edges of parts of other rubber articles.

In making nipples it is customary to superimpose one sheet of unvulcanized rubber on another, and then cut out from the sheets by a suitable die as many incipient nipples as the sheets will afford, each incipient nipple being composed of two blanks. The edges of the blanks, excepting those which form the mouth of the nipple, are then coated with rubber cement, which causes sufficient adhesion between the edges to prevent their separation before the butt-seaming operation. The mouth of the nipple is then opened and placed upon an anvil, the acting face of which is curved and is adapted to turn about a central axis. The bulging of the central portions of the blanks caused by the insertion of the anvil between them, causes their edges to approach each other so that a V-shaped groove is formed between said edges. While the nipple is supported by the anvil, the edge portions are acted on by instrumentalities which abut the edges against each other and close the V-shaped groove.

My invention has for its object to provide an improved butt-seaming machine adapted to cause a close pressure of the blank edges against each other to form a continuous and closely compacted joint, and to operate rapidly and at the same time without objectionable noise, jar and wear of working parts.

The invention consists in the improvements which I will now proceed to describe and claim.

Of the accompanying drawings forming a part of this specification,—Figure 1 represents an end elevation of a machine embodying my invention. Fig. 2 represents a side elevation of the same. Fig. 2^a represents a plan view of parts of the slide and connecting-rods hereinafter referred to. Fig. 3 represents a plan view of one of the reciprocating hammers and the toggle mechanism which reciprocates it, the hammer being retracted. Fig. 4 represents a plan view of the hammer and toggle mechanism, the hammer being projected. Fig. 5 represents a view similar to Fig. 3, showing a different position of the toggle mechanism. Fig. 6 represents an end view of an incipient nipple composed of two blanks lying flat against each other. Fig. 7 represents a side view of the anvil and a nipple applied thereto, a portion of one of the hammers being shown. Fig. 8 represents a section on line 8—8 of Fig. 7, the hammers being retracted. Fig. 9 represents a view similar to Fig. 8, showing the hammers projected. Figs. 10 and 11 represent views similar to Fig. 7, showing the anvil and nipple in different positions.

The same reference characters indicate the same parts in all of the figures.

In the drawings, 12 represents a base supporting a standard 13, to which is attached an arm 14 overhanging the base.

15 represents the anvil which has an arc-shaped face 15^a, adapted to bear on the inner surface of an incipient nipple composed of two unvulcanized rubber pieces 16, the edges of which (excepting at the mouth of the nipple) are lightly connected by a coating 16^a of rubber cement. This forms a flexible bond between said edges, so that when the nipple is opened and placed on the anvil the bonded edges swing toward each other and form the sides of a V-shaped groove 16^b, Fig. 8. The anvil is formed on an elongated shank 15^b attached to one end of a curved arm 21, the opposite end of which is attached to a rock-shaft 17 journaled in a fixed bearing 18 on the standard 13, the relative arrangement of the anvil and rock-shaft being such that the arcuate

face 15^a of the anvil is concentric with the axial line of the rock-shaft, so that the highest or work-supporting portion of said face is always at the same height and in the same position relatively to the hammers hereinafter described, the anvil being adapted to be turned by hand to either of the horizontal positions shown by Figs. 7 and 11, and to a vertical position, as shown by Fig. 10, and to various intermediate positions.

19, 19 represent reciprocating hammers which are movable in fixed guides 20 on the arm 14, the hammers being oppositely inclined and arranged so that their acting faces 19^a which are opposed to the anvil face 15^a, move toward and from said anvil face, as shown by Figs. 8 and 9. The hammers are moved simultaneously toward and from the anvil by the mechanism hereinafter described, and, when projected from the retracted position shown by Fig. 8, bear on the edge portions of the nipple pieces 16 which are supported by the highest part of the anvil face, and press said portions inward and slightly downward, thus butting the edges closely against each other and compacting the joint or seam and the material adjacent thereto.

The hammers are reciprocated by the mechanism next described. Each hammer has a stud 22 to which is pivoted one end of an inner toggle link 23, the opposite end of which is connected by a pivot stud 24 with a connecting-rod 25 and with one end of an outer toggle link 26. The opposite end of the link 26 is pivoted on a fixed stud 27 attached to a guide 20. When the connecting-rod is reciprocated the toggle links 23 and 26 reciprocate the hammer, as indicated by Figs. 3, 4, and 5, there being two pairs of toggle links, one pair for each hammer, and two connecting-rods, one for each pair of toggle links.

29 represents a driving shaft journaled in a bearing on a fixed standard 28 and provided with a face plate 30 at one end having an eccentric wrist-pin 31, to which is connected a pitman 32.

34 represents a slide movable in a fixed guide 35 and connected at 33 with the pitman 32. The opposite end of said slide is provided with two ears 36 (Fig. 2^a), which are pivoted to the two connecting-rods 25. The slide 34 and connecting-rods 25 are reciprocated by the rotation of the driving-shaft and the connection between the connecting-rods 25 and the hammers, through the toggle links, is such that for each rotation of the driving-shaft and each reciprocation of the slide 34 and rods 25, the hammers are reciprocated twice, as illustrated by Figs. 3, 4, and 5. It will be seen, therefore, that the driving-shaft and the mechanism

connecting it with the hammers may be moved at a relatively slow speed without sacrificing the rapidity of movement desirable for the hammers, so that the machine is adapted to be operated without objectionable noise and vibration and injurious wear, the only parts moving at a relatively high speed being the hammers.

In practice it is desirable to cause each hammer to reciprocate about sixteen hundred times per minute, and this is accomplished by rotating the driving-shaft and reciprocating the slide 34 and connecting-rods 25 eight hundred times per minute.

The seam is formed progressively, the operator first holding the anvil in a horizontal position (Fig. 7) and moving the nipple lengthwise until its crown portion reaches the anvil, then moving the anvil gradually to and past a vertical position (Fig. 10) while acting on the crown portion, and then swinging the anvil to another horizontal position (Fig. 11), and again moving the nipple lengthwise until the seam is formed to the mouth of the nipple at the opposite side from the starting point.

I do not limit myself to the particular construction of the toggle-operating mechanism here shown, and may variously modify the same without departing from the spirit of the invention.

The bearing 18 is preferably vertically adjustable on the standard 13, to enable the hammers to be adjusted to the thickness of the rubber employed, the bearing being provided with an ear 39 having a slot 40, through which passes a screw 41, securing the bearing to the standard 13.

The arm 21 and anvil 15 may be confined in a horizontal position (Figs. 7 and 11) by a spring latch 42 having an orifice 43 adapted to engage either of two rounded studs 44 on the hub portion of the arm, there being two studs located at opposite sides of the said hub portion.

I claim:

1. A butt-seaming machine comprising an anvil having an arc-shaped face and adapted to turn on an axis with which said face is substantially concentric, a pair of hammers having acting faces opposed to the anvil face, means for guiding said hammers in paths which are oppositely inclined relatively to the said axis, and mechanism for reciprocating said hammers to cause their acting faces to simultaneously approach and recede from the anvil.

2. A butt-seaming machine comprising an anvil having an arc-shaped face and adapted to turn on an axis with which said face is substantially concentric, a pair of hammers having acting faces opposed to the anvil face, fixed hammer guides which are oppo-

sitely inclined relatively to said axis, two
pairs of toggle links, each pair consisting
of an outer link pivoted to a fixed support
and an inner link pivoted to one of said
5 hammers, a pair of connecting-rods, each
pivoted to the meeting ends of a pair of
links, a driving-shaft and connections be-
tween said shafts and the connecting-rods

whereby each rotation of the shaft causes
two reciprocations of each hammer.

In testimony whereof I have affixed my
signature, in presence of two witnesses.

CHARLES L. TURNER.

Witnesses:

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P. W. PEZZETTI.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."