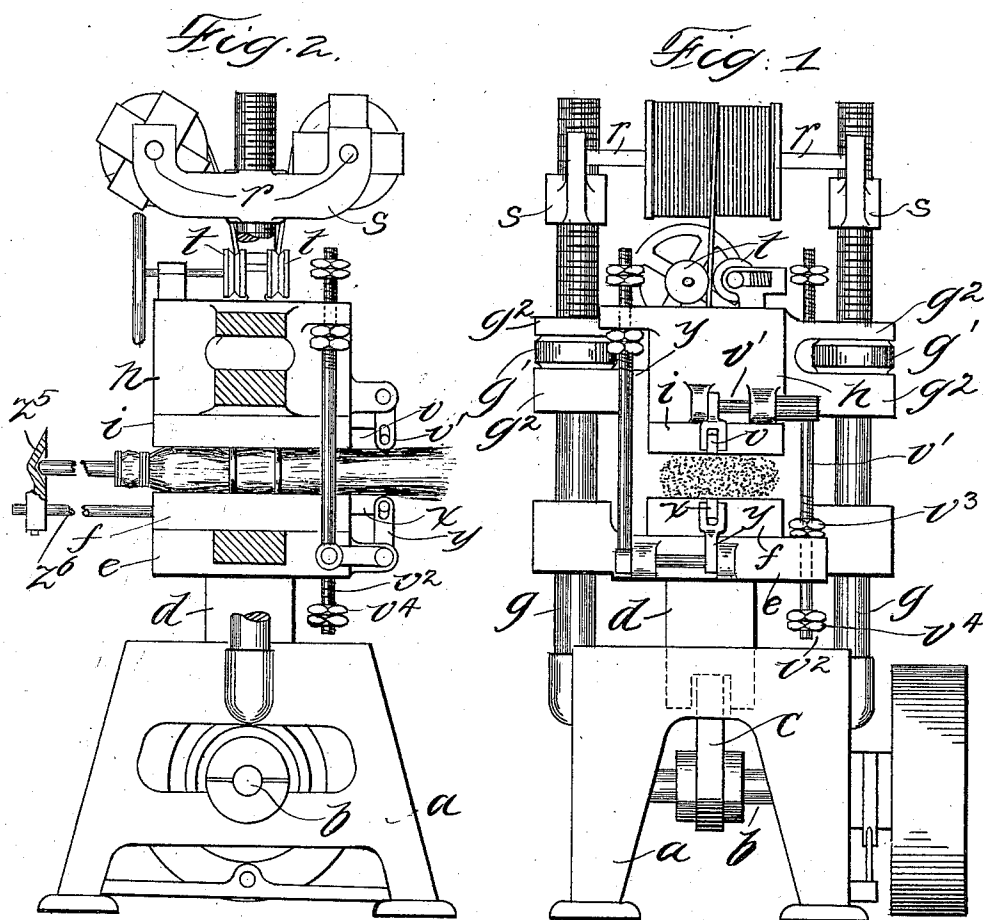


J. S. McCHESNEY.
BROOM BANDING MACHINE.
APPLICATION FILED DEC. 9, 1908.

1,014,887.

Patented Jan. 16, 1912.

2 SHEETS—SHEET 1.



WITNESSES:

R. E. Atherton.
H. F. Stark

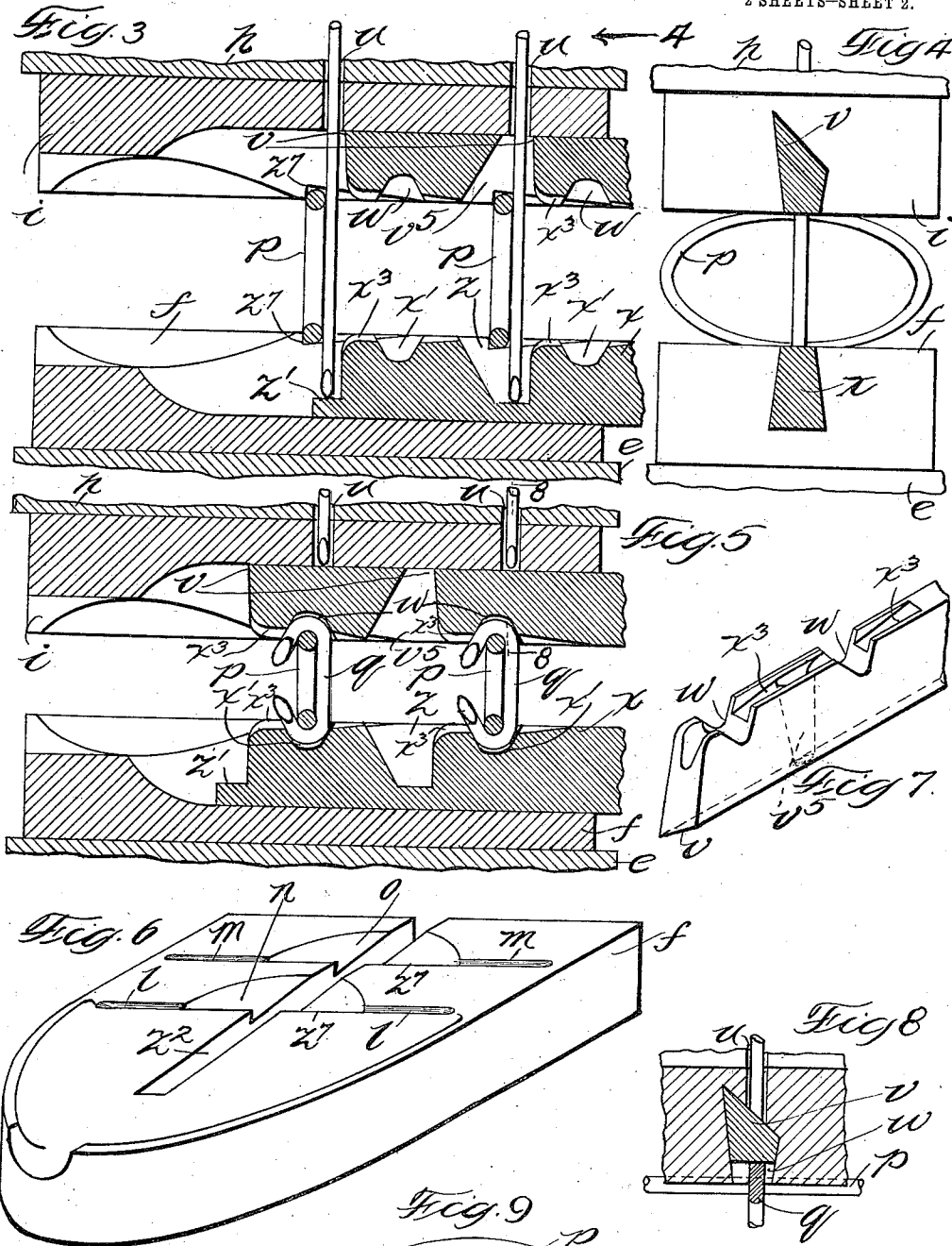
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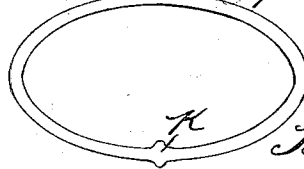
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2 SHEETS-SHEET 2.



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UNITED STATES PATENT OFFICE.

JOHN SHERMAN McCHESNEY, OF CHICAGO, ILLINOIS.

BROOM-BANDING MACHINE.

1,014,887.

Specification of Letters Patent.

Patented Jan. 16, 1912.

Application filed December 9, 1908. Serial No. 466,600.

To all whom it may concern:

Be it known that I, JOHN SHERMAN McCHESNEY, citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Broom-Banding Machines, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to the manufacture of brooms, and has for its object the provision of a broom banding machine whereby I am enabled to employ previously formed bands that may be put in place about the straw body or waist of a broom, the machine of my invention preferably also being of service in stapling the bands into engagement with the broom straw.

I will explain my invention more fully by a description of the preferred embodiment thereof, shown in the accompanying drawings, to which embodiment of my invention, however, I do not wish to be limited.

In the drawings—Figure 1 is a rear elevation of a machine constructed in accordance with the preferred embodiment of my invention, certain parts being broken away more clearly to reveal certain details of construction. Fig. 2 is a side elevation, partially in section, of the structure shown in Fig. 1. Fig. 3 is a sectional elevation of a portion of the die structure entering into the machine of my invention, the dies being in separated relation preparatory to receiving the continuous bands and the broom about which the bands are to be disposed. Fig. 4 is an end view of the parts as they appear in Fig. 3, in the direction of arrow 4 of Fig. 3. Fig. 5 is a view of the mechanism illustrated in Fig. 4, with the parts rearranged. Fig. 6 is a perspective view of one of the dies, the two dies being preferably similar in formation. Fig. 7 is a perspective view of the principal portion of the reciprocating element provided in association with the upper die, this element being turned bottom-side-up for purpose of illustration. Fig. 8 is a sectional view of a part of the structure shown in Fig. 5 on line 8, 8. Fig. 9 is a view of one previously formed band that may be employed in connection with the invention.

Like parts are indicated by similar characters of reference throughout the different figures.

The base *a* of the machine carries the rotating operating shaft *b* driven by any suitable means which need not be illustrated nor described, and which shaft *b* is in cam or crank connection with a pitman *c* that is articulated to the vertically moving plunger *d*, which plunger carries a suitable base-plate *e* upon which the lower die *f* may be suitably secured. As the shaft *b* is rotated, the plunger *d* is reciprocated, whereby the lower die plate *f* is also reciprocated. The base *a* of the machine is desirably provided with two rods *g* that are threaded at their upper ends and there surrounded by nuts *g*¹ which are interposed between the bifurcated extensions *g*² that encompass the rods *g* and are free to move along the same. The arms *g*² constitute extensions of a block *h* which supports upon its under surface the upper die plate *i* which is located in suitable registering relation with the lower die plate *f*, these die plates being more fully hereinafter described. By means of the nuts *g*¹ the proximity with which the die *f* may approach the die *i* is regulated, and by means of one or the other of said nuts *g*¹ the plane of the die *i* is properly adjusted with respect to the plane of the die *f*. Each of these dies is preferably constructed as illustrated most clearly in Figs. 3, 5 and 6, Fig. 6 being the clearest of these three views.

It has hitherto been the common practice to wind wire about the waists or bodies of brooms, but by means of my invention I am enabled to employ previously formed bands, which are desirably elliptical in shape, as indicated in Fig. 9, the bands which I prefer to employ being formed of iron rod that is turned into the desired shape and which has its free ends welded to form the butt-weld indicated at *k*, Fig. 9. I do not wish to be limited, however, to the use of bands that are initially of elliptical shape, nor to bands that are previously formed in the manner described. I desirably dispose two bands about the waist of each broom and when two bands are thus disposed about the broom waists, I provide each die with two channels *l m* that extend transversely to the length of the broom and which are of a width suited to the thickness of the metal of the bands, the faces of the dies be-

ing inclined at $n o$ toward the grooves $l m$, so that when the dies are in a separated relation, the previously formed bands may readily be guided into a position, as indicated in Fig. 3. After the bands have been positioned, the lower die is moved toward the upper die, so that the partially flattened bands are thereafter flattened to the full extent desired so as to grip the broom about its waist, the grooves $l m$ more fully receiving the bands when thus flattened. It is preferable to provide means for preventing the slippage of the bands (p) along the broom bodies, to which end I preferably pass staples q through the broom body and into clenching engagement with the bands p and with neighboring broom straws, so as to securely hold the bands p from being longitudinally moved with respect to the broom. I find that one staple q per band is sufficient. These staples are preferably not only applied by the machine of my invention, but are also desirably formed thereby, to which end I employ two bobbin shafts r supported upon forked brackets s that are in threaded engagement with the rods g . Each bobbin shaft supports a bobbin of wire, the wire being led from the bobbins between presser wheels t through apertures u in the block h and the die i carried beneath the same, these apertures u being located in planes to the rear of the planes that are occupied by the bands p when in place within the dies i and f . Preferably after compression of the bands p has commenced, the wire, which was previously fed through the apertures u to the fullest extent, is sheared off as a result of the reciprocating movement of the cutter v , which reciprocating movement is brought about by means of the mechanism illustrated most clearly in Figs. 1 and 2, where I have illustrated the rear end of the cutting element v in pin and slot engagement with the bifurcated end of a bell-crank device v^1 having a threaded extension v^2 passing through the base-plate e , the threaded element v^2 having nuts $v^3 v^4$ whereby the said base-plate is caused to actuate the bell-crank structure v^1 in one direction when the die f is elevated, in order to shear the wire passing through the apertures u and in the reverse direction when the die f is lowered to withdraw the cutting element v , the nuts $v^3 v^4$ being sufficiently separated to permit lost motion that will be sufficient to permit of proper relative movement between the dies before the cutter v is actuated. The cutter v not only shears the wire that is to form the binding staples, but also desirably takes part in clenching the staples about the bands p and the neighboring broom straw, the upper portions of the staples q being thus brought into clenching engagement by the element v . To this end, the element v is desirably shaped as indicated in Fig. 7,

which shows said element reversed so as to reveal the bottom thereof, the forward or approaching end of the cutter v having curve portions to engage and inturn the upper ends of the staple wire preparatory to stapling engagement with the broom straw.

When the lower die f has been moved well up, the pockets w in the element v are caused to engage and press the upper portions of the staples q into the shapes illustrated in Fig. 5, further upward movement of the die f thereafter following in order to properly compress the bands p . I desirably upturn the lower ends of the staples q by a structural element x which has pockets x^1 that are similar in function and located in approximate alinement with the pockets w . The elements $v x$ move in unison longitudinally of the dies and are reciprocated toward and from each other relatively, the element x having a bell-crank structure y that affords an inter-relation between the block h and the element x which is similar to the inter-relation afforded by the bell-crank structure v^1 between the base e and the element v . The element x has a recess z in alinement with the aperture v^5 and a shoulder z^1 to determine the extent to which the wires are fed through the apertures u downwardly.

Where the bands have the enlargements k formed by butt-welding, as indicated in Fig. 9, I desirably provide clearance in at least one, and preferably in both, of the dies f and i , as indicated most clearly in Fig. 6 at z^2 , which clearance permits the bands to be located in place, as one or the other of said clearances is adapted to accommodate the enlargement k , permitting the balance of the band properly to be seated. Where the elements v and x are employed, they are disposed and adapted to reciprocate within these clearances z^2 in directions parallel to the direction in which the broom is fed into the machine, the portions of the clearances z^2 that are required for the enlargements k being provided in the elements v and x by means of the slopes x^2 in said elements v and x .

It will be observed that the cutting element v cuts the wires passing through the apertures u on the bias, whereby said wires are sharpened to permit them to be fed through the mass of broom straws in the body or waist of the broom. Any suitable mechanism may be employed for feeding the wire through the apertures u .

The broom is passed between the dies, handle first, and inasmuch as the bands p are previously in position, the handle and broom waist of each broom is passed through said bands, which are not shifted from their vertical positions owing to the engagement of said bands with the shoulders z^1 as clearly illustrated in Figs. 3 and 6.

The extent to which the broom may be passed through the bands is limited by the stop z^5 adjustably secured upon a rod z^6 fixedly supported with respect to the die f , the stop z^5 serving to engage the end of the broom handle.

I have not deemed it necessary to clearly illustrate nor describe the mechanism by which the movement of the die f is controlled, as such mechanism is so well known to those familiar with machine presses.

While I have shown previously formed bands which are endless or continuous, I do not wish to be limited to bands of such characteristics, as it is obvious that the bands need not be continuous if the metal of which they are formed is sufficiently rigid.

It will be seen that I have provided a machine including one die, a companion die, mechanism for moving one of said dies toward the other, said dies being adapted to compress a band about the waist of a broom previously passed through the band, there being means for holding the band in position to enable the dies to act thereupon, and stapling mechanism for stapling the band and broom straw together, said stapling mechanism including two members slidable substantially parallel to the direction in which the broom is fed and having relative motion similar to the relative movement between the dies and serving to turn in the staple wire when relatively approached.

While I have herein shown and particularly described the preferred embodiment of my invention, I do not wish to be limited to the precise construction shown, as changes may readily be made without departing from the spirit of the invention.

Having thus described my invention, I claim as new and desire to secure by Letters Patent the following:—

1. A machine of the character described including one die, a companion die, mechanism for moving one of said dies toward the other, said dies being provided with formations for holding previously formed bands into position, said dies being adapted to compress a band about the waist of a broom previously passed into the band, and stapling mechanism for stapling the band and broom straw together, said stapling mechanism including two members slidable substantially parallel in the direction in which the broom is fed and having relative motion similar to the relative movement between the dies and serving to turn in the staple wire when relatively approached.

2. A machine of the character described including one die, a companion die, mechanism for moving one of said dies toward the other, said dies being provided with formations for holding previously formed bands in position, said dies being adapted

to compress a band about the waist of a broom previously passed into the band, stapling mechanism for stapling the band and broom straw together, said stapling mechanism including two members slidable substantially parallel to the direction in which the broom is fed and having relative motion similar to the relative movement between the dies and serving to turn in the staple wire when relatively approached, one of said members being adapted to shear wire that is to form the staples, and mechanism for feeding said wire.

3. A machine of the character described including one die, a companion die, mechanism for moving one of said dies toward the other, said dies being provided with formations for holding previously formed bands in position, said dies being adapted to compress a band about the waist of a broom previously passed into the band, stapling mechanism for stapling the band and broom straw together, said stapling mechanism including two members slidable substantially parallel to the direction in which the broom is fed and having relative motion similar to the relative movement between the dies and serving to turn in the staple wire when relatively approached, one of said members being adapted to shear wire that is to form the staples, and mechanism for feeding said wire, said cutting mechanism acting to cut the wire on the bias, whereby it may be fed through the broom straw preparatory to the stapling operation.

4. A machine of the character described including two members adapted to hold a previously formed band in position and provided with band-receiving grooves in their opposed faces, mechanism for effecting relative motion between said members, whereby said band may be compressed about a broom waist previously passed thereinto, said mechanism permitting the broom handle to be passed between said members and through the band in order that the waist of the broom may be passed into the band, and stapling mechanism operable by the member actuating mechanism for stapling the band and broom straw together.

5. A machine of the character described including two members adapted to hold a previously formed band in position and provided with band-receiving grooves in their opposed faces, one of said grooves being enlarged to receive the band enlargement formed in the band structure in the process of making the same, mechanism for effecting relative motion between said members, whereby said band may be compressed about a broom waist previously passed thereinto, said mechanism permitting the broom handle to be passed between said members and through the band in order that the waist of the broom may be passed into the

band, and stapling mechanism operable by the member actuating mechanism for stapling the band and broom straw together.

6. A machine of the character described
5 including two members adapted to hold a previously formed band in position, mechanism for effecting relative motion between said members, whereby said band may be compressed about a broom waist previously
10 passed thereinto, said mechanism permitting the broom handle to be passed between said members and through the band in order that

the waist of the broom may be passed into the band, and a stop for engaging the broom handle and limiting the extent to which the broom may be passed through the band. 15

In witness whereof, I hereunto subscribe my name this 18th day of November A. D. 1908.

JOHN SHERMAN McCHESENEY.

Witnesses:

L. G. STROH,

G. L. CRAGG.

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