A. KIPNISS & M. P. NEUMANN.

MACHINE FOR MAKING METAL BINDING FOR SUITCASES.

APPLICATION FILED DEC. 7, 1916.

1,244,985. Patented Oct. 30, 1917.

3 SHEETS—SHEET 1.

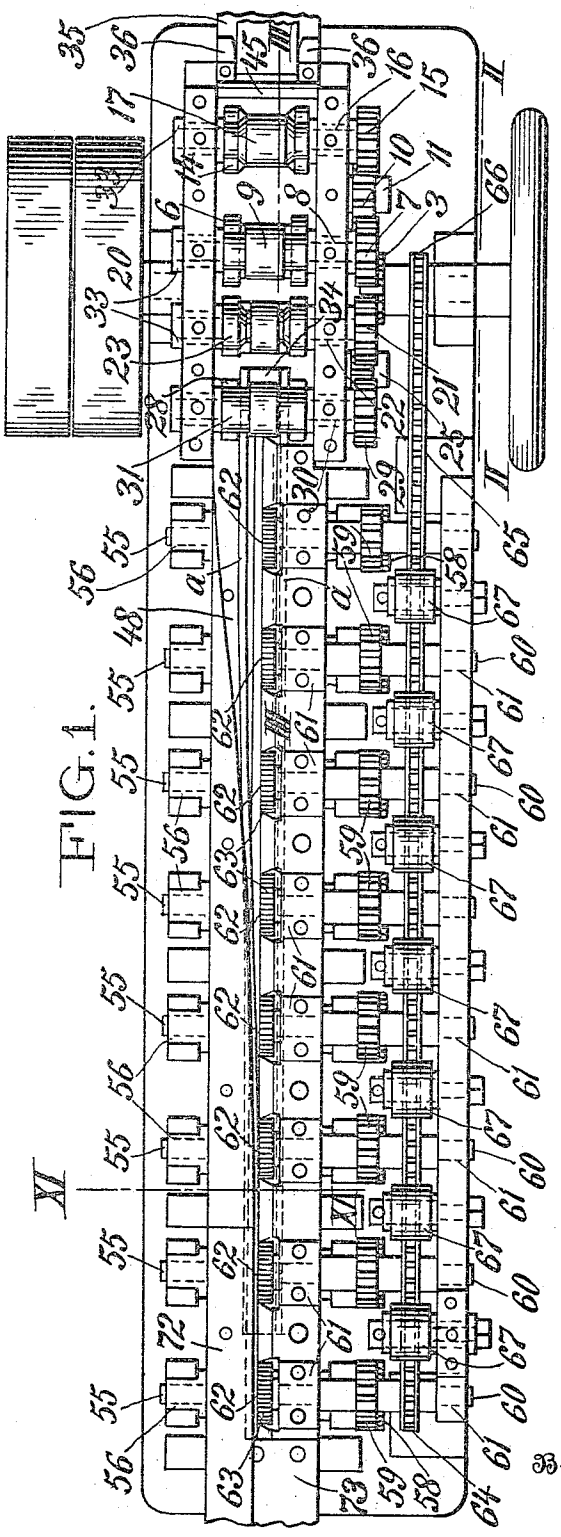


FIG. 1.

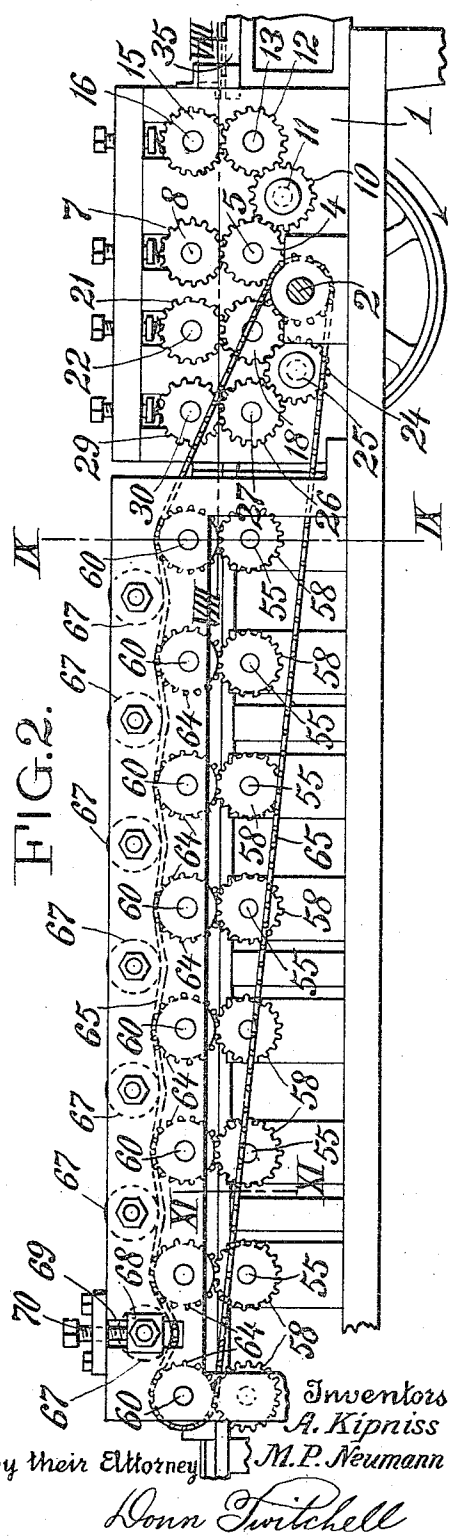


FIG. 2.

Inventors
A. Kipniss
M. P. Neumann
By their Attorney
Donn Twitchell

A. KIPNISS & M. P. NEUMANN.

MACHINE FOR MAKING METAL BINDING FOR SUITCASES.

APPLICATION FILED DEC. 7, 1916.

1,244,985. Patented Oct. 30, 1917.

3 SHEETS—SHEET 2.

FIG.3.

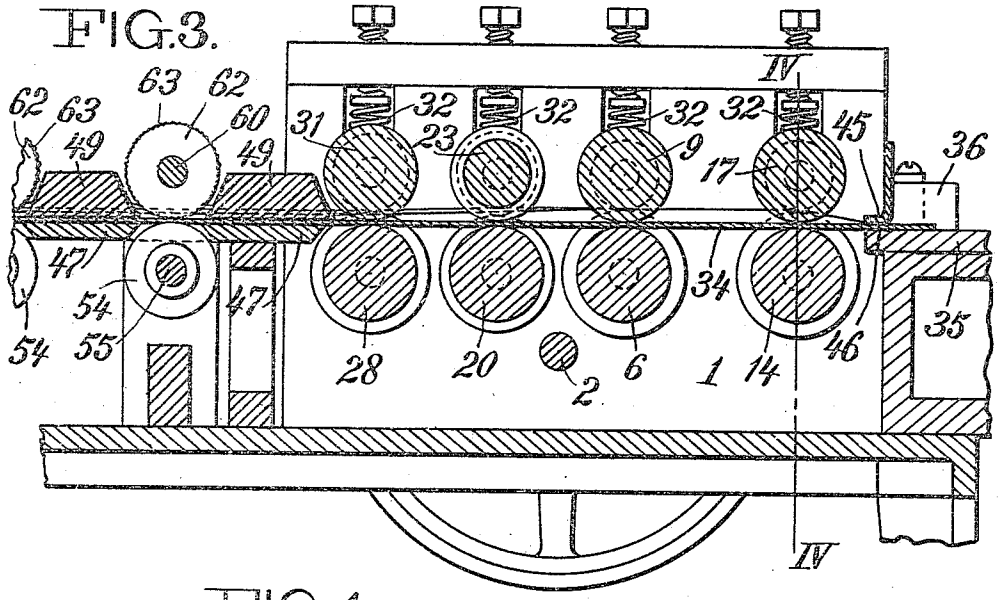


FIG.4.

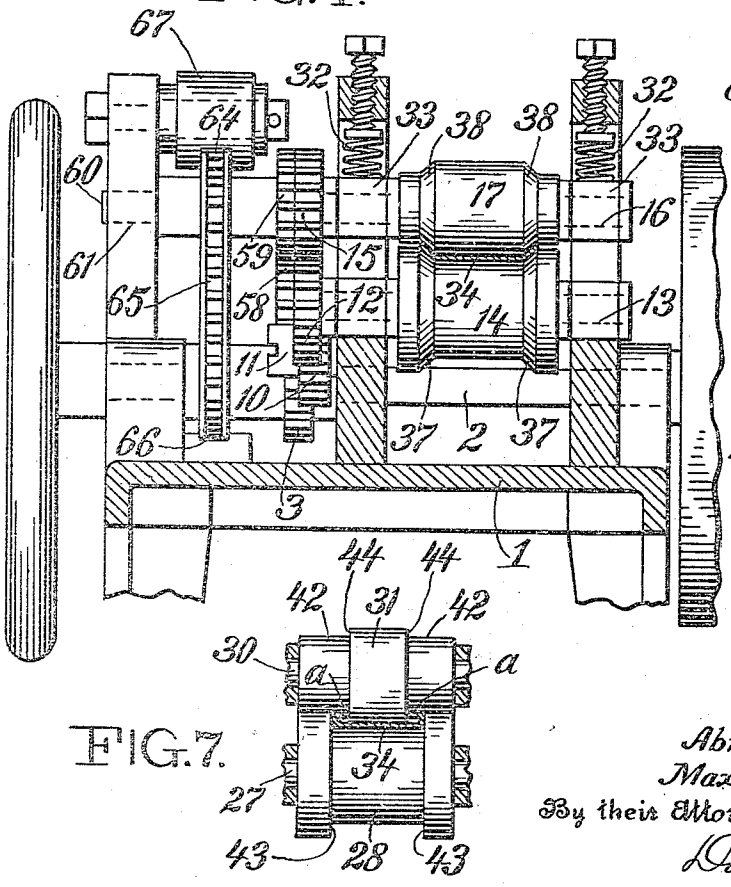


FIG.5.

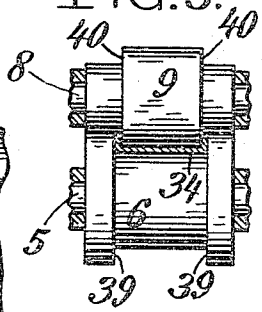


FIG.6.

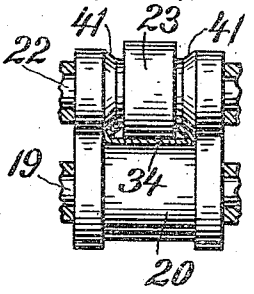


FIG.7.

Inventors
Abraham Kipniss
Max Paul Neumann
By their Attorney
Donn Twitchell

A. KIPNISS & M. P. NEUMANN.

MACHINE FOR MAKING METAL BINDING FOR SUITCASES.

APPLICATION FILED DEC. 7, 1916.

1,244,985. Patented Oct. 30, 1917.

3 SHEETS—SHEET 3.

FIG. 8.

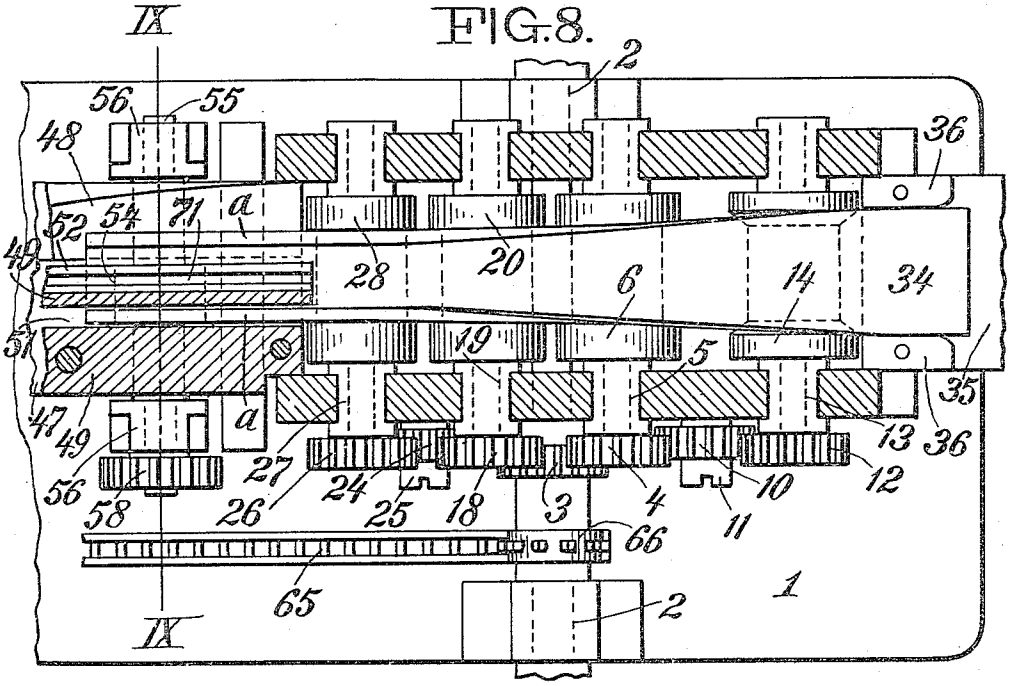


FIG. 12.

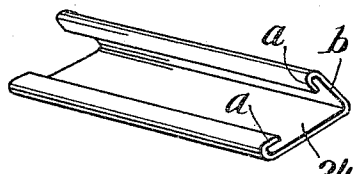


FIG. 13.



FIG. 10.

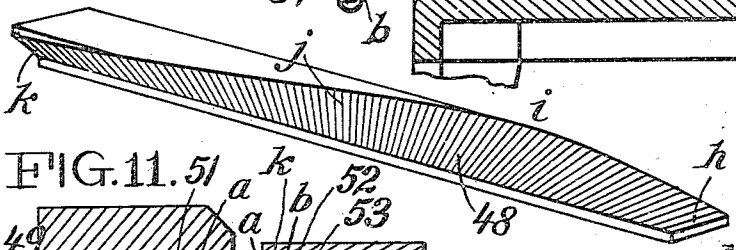


FIG. 11.

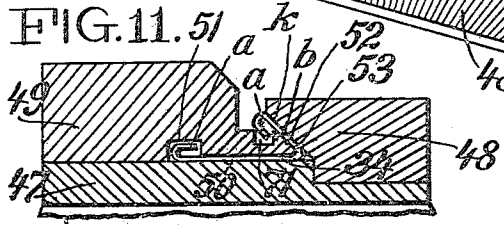
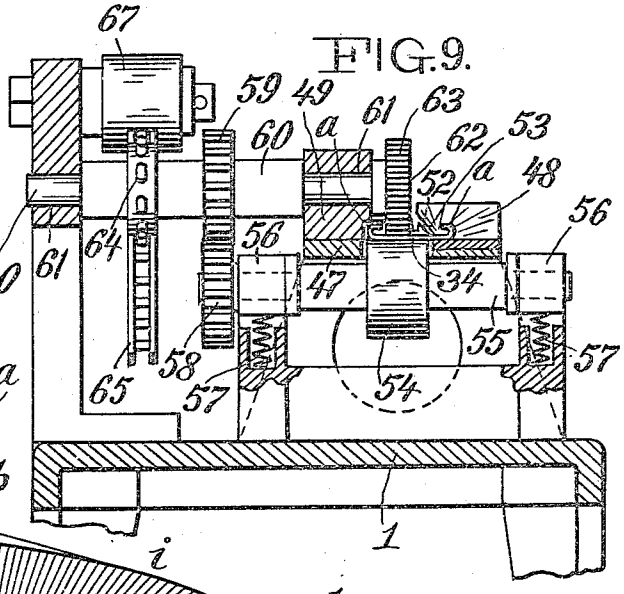


FIG. 9.



Inventors
Abraham Kipniss
Max Paul Neumann
By their Attorney
Donn Twitchell

UNITED STATES PATENT OFFICE.

ABRAHAM KIPNISS AND MAX PAUL NEUMANN, OF NEW YORK, N. Y., ASSIGNORS TO BENJAMIN MARKOWITZ, OF NEW YORK, N. Y.

MACHINE FOR MAKING METAL BINDING FOR SUITCASES.

1,244,985. Specification of Letters Patent. Patented Oct. 30, 1917.

Application filed December 7, 1916. Serial No. 135,628.

To all whom it may concern:

Be it known that we, ABRAHAM KIPNISS, a citizen of the United States, and a resident of the city of New York, in the county of Kings and State of New York, and MAX PAUL NEUMANN, a citizen of the United States, and a resident of the city of New York, in the county of Queens and State of New York, have invented a certain new and useful Machine for Making Metal Binding for Suitcases, of which the following is a specification.

This invention relates to machines for shaping sheet metal to a special form known as "metal binding," which binding is used in the manufacture of suit cases and other receptacles.

The object is to provide automatic mechanism adapted to move sheet metal rapidly through the machine and simultaneously bend the metal to the desired form.

The invention consists of a series of pairs of feed rollers which are arranged to impart forward movement to a strip of sheet metal. Several of said pairs of feed rollers at the feed end of the machine are adapted to bend the edges of the strip back nearly upon itself. Other pairs of said feed rollers at the middle of the machine are arranged to force one of said bent edges against a spirally shaped guide and the edge of a straight guide bar, which serves to bend said edge so that it has the relation to the body of the strip that is desired for said "metal binding." Pairs of said feed rollers are arranged at the delivery end of the machine to move said bent strip forward away from the machine.

In the accompanying drawings, Figure 1 is a plan view of the machine.

Fig. 2 is a sectional elevation, on the line II—II of Fig. 1.

Fig. 3 is a section on the line III—III of Fig. 1.

Fig. 4 is a transverse section on the line IV—IV of Fig. 3, and showing the passage of a strip of sheet metal between a pair of feed rollers adapted for bending the edge of the strip to obtuse angles therefrom.

Fig. 5 shows the passage of said strip between a pair of rollers adapted for bending the edges to right angles from the strip.

Fig. 6 shows the passage of said strip between a pair of rollers adapted for bending the edges to acute angles from the strip.

Fig. 7 shows the passage of said strip between a pair of feed rollers adapted for bending the edges so that they stand parallel with the body of the strip.

Fig. 8 is a horizontal section, approximately on the line VIII—VIII of Fig. 2.

Fig. 9 is a transverse section on the line IX—IX of Figs. 2 and 8.

Fig. 10 is a perspective view of the spirally shaped guide.

Fig. 11 is a transverse section on the line XI—XI of Figs. 1 and 2.

Fig. 12 is a perspective view of the strip after it is bent by passage along the spirally shaped guide.

Fig. 13 is a detail view showing the strip further bent when it has been removed from the machine and applied as metal binding to a suit case.

Journaled in the frame 1 of the machine, is a driving shaft 2, to which is secured a gear wheel 3. Gear wheel 3 is in mesh with a gear wheel 4, secured to a shaft 5, to which a roller 6 is secured. In mesh with gear wheel 4 is a gear wheel 7, secured to a shaft 8, to which a roller 9 is secured. Also in mesh with gear wheel 4 is a gear wheel 10, which is journaled on a fixed shaft 11. In mesh with gear wheel 10 is a gear wheel 12, secured to a shaft 13, to which a roller 14 is secured. Gear wheel 12 is in mesh with a gear wheel 15, secured to a shaft 16, to which a roller 17 is secured.

In mesh with a gear wheel 3, is a gear wheel 18, secured to a shaft 19, to which a roller 20 is secured. Gear wheel 18 is in mesh with a gear wheel 21, secured to a shaft 22 to which a roller 23 is secured. Also in mesh with gear wheel 18 is a gear wheel 24 which is journaled on a fixed shaft 25. In mesh with gear wheel 24 is a gear wheel 26 secured to a shaft 27, to which is secured a roller 28. Gear wheel 26 is in mesh with a gear wheel 29, secured to a shaft 30, to which a roller 31 is secured.

It will be seen, that by means of the gearing described, rotation of the driving shaft 2 causes rotation of the pair of rollers 14 and 17, pair 6 and 9, pair 20 and 23, and

pair 28 and 31. The upper roller of each pair is forced down upon the lower roller by means of springs 32, which bear against sliding boxes 33 in which the shafts of the upper rollers are journaled.

A strip of sheet metal 34 may be placed upon a horizontal support 35, and passed forward between lateral guides 36 and between the upper and lower rollers of each of the series of pairs, whereby forward movement is imparted to the strip. The rollers are shaped so that as the strip is moved forward between them, the edges of the strip are bent back to form the folds *a*.

The first pair of rollers 14 and 17 is provided with coöperating inclined surfaces 37 and 38, adapted for bending the edges of the strip to obtuse angles from the strip. The second pair of rollers 6 and 9 is provided with coöperating right angular surfaces 39 and 40 adapted for further bending the edges of the strip to right angles therefrom. The third pair of rollers 20 and 23 is adapted for further bending the edges to acute angles from the strip, this being accomplished by means of inwardly inclined surfaces 41 formed on the upper roller 23. The fourth pair of rollers is adapted for further bending the edges so that they stand parallel with the strip, thereby forming the folds *a*. This is accomplished by means of cylindrical surfaces 42 formed on the upper roller 31, the folds *a* being forced between guiding shoulders 43 and 44 formed on said pair of rollers.

A guide 45 is placed above the support 35 so that a passage 46 is formed having a height approximately equal to the thickness of the strip 34 that is passed to the feed rollers. The strip having the edges bent in the manner described and moved forward by means of the feed rollers, passes on to a horizontal supporting bar 47; and one of the folds *a* and a portion of the strip travels against a spirally shaped guide 48. The portion of the strip not traveling against spiral guide 48, passes between the support 47 and an upper bar 49, a passage 50 being left, through which the strip may pass. The upper bar 49 is provided with a guide 51 through which the other fold *a* may pass; and one side of the bar is shaped so that its surface 52 extends at an angle of about 45° from the support 47.

The spiral guide 48 is provided at one end with a surface *h* which extends horizontally beneath one edge *a* and a portion of the strip as it passes from between the shaping feed rollers. The guide 48 changes gradually in spiral form, so that at the point *i* it is inclined to an angle of about 45°, at *j* it stands vertical, and at *k* it is inclined to an angle of about 45° on the side of the vertical opposite to that in which surface *i* is inclined. Surface *k* is inclined in the same direction as surface 52 and a narrow space 53 is left between the two surfaces.

Located at short distances apart throughout the length of support 47, are rollers 54 which serve to support the strip 34 slightly above the support 47. Each roller is secured to a shaft 55, journaled in bearings 56, which are moved upward by means of springs 57. Secured to each shaft 55 is a gear wheel 58 in mesh with a gear wheel 59 forming part of a shaft 60 which is journaled in bearings 61. Attached to each shaft 60 is a wheel 62, the periphery of which is provided with a roughened surface 63, which bears upon the upper side of a strip 34 that may be passing between it and a roller 54 beneath.

Secured to each shaft 60 is a chain wheel 64, over which rides the upper run of an endless chain 65 which is driven by means of a chain wheel 66, secured to the driving shaft 2. A series of idle pulleys 67 serve to hold the chain in engagement with the teeth of chain wheels 64. One of the pulleys 67 is mounted on a slide 68, which is free to move in guides 69 and adjusted by means of a screw 70, so that slack in the chain may be taken up when necessary to secure engagement of the chain with the chain wheels 64.

It will be evident that rotation of the driving shaft 2 in the direction indicated by the arrow, will cause rotation of the shaping feed rollers, and the series of pairs of rollers 54 and 62 in a direction to cause continued forward movement of the strip 34 between the bars 47 and 49. During this forward movement of strip 34, the fold *a* and part of the strip bearing against the guide 48, and traveling in succession along the surfaces *h*, *i*, *j* and *k*, are bent from the position shown in Fig. 9 to the position shown in Fig. 11. This bending of the strip during its forward travel is effected by the action of bars 47 and 49 in holding the other part of the strip in place, while the spiral guide constantly forces the part of the strip bearing thereon against the sharp angular edge formed by the junction of inclined surface 52 with the lower side of the bar 49, thereby effecting a firm fold of the strip in line with the edge of the bar, and causing said part of the strip bearing against the spiral to be forced against the inclined surface 52 of the bar 49. It will be noticed that as the surfaces *h*, *i*, *j* and *k* of the spiral are all inclined toward the sharp angular edge of the bar 49, they act to uniformly force the strip against said edge, so that during successive movements of any one portion of the strip along the spiral and edge of bar 49, the other portions of the strip traveling along the spiral are being held against the edge of bar 49, and bent to whatever position may be caused by the spiral, thereby causing the portion of

the strip folded over the edge of bar 49 to be held there time enough for the metal of the strip to become set. As shown in Fig. 11 the fold *b* of the strip passes through the space 53 formed between surface *k* of the spiral and the inclined surface 52 formed on the bar 49. The upper bar 49 is provided with a groove 71, in which the fold *a* of this folded part of the strip may travel during further forward movement of the strip between the bars 47, 49 and a guide 72 having a shape similar to the part of spiral guide 48 shown in Fig. 11.

The two pairs of feed rollers 54 and 62, located next to the outer end of the upper bar 49, serve to move the strip, bent in the manner described, to rest upon a support 73 extending beyond the outer end of the upper bar 49. The bent strip then has the appearance shown in Fig. 12.

In Fig. 13 is shown the manner in which the finished product shown in Fig. 12 is bent upon a portion 74 of a suit case.

Having thus described our invention, what we claim is:

1. In a machine for longitudinally bending a strip of sheet material, means forming a defined path through which a portion of the strip is fed and provided with a straight edge, means for acting upon the other portion of said strip comprising a member having a spiral surface whose inclination varies gradually from an initial position in substantially the plane of the strip to an acutely inclined position relative thereto, one edge of said surface being adjacent to and parallel with said straight edge, and means for feeding the strip parallel to said straight edge.

2. In a machine for longitudinally bending a strip of sheet metal, means forming a defined path through which a portion of the strip is fed and provided with a straight edge; means for acting upon the other portion of said strip comprising a member having a spiral surface whose inclination varies gradually from an initial position in substantially the plane of the strip to a position overhanging said straight edge, one edge of said surface being adjacent to and parallel with said straight edge; and means for feeding the strip parallel to said straight edge.

Signed at New York city, in the county of New York and State of New York, this 29th day of November, A. D. 1916.

ABRAHAM KIPNISS.
MAX PAUL NEUMANN.

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