

Nov. 10, 1942.

C. K. BILLEB

2,301,771

ART OF PRODUCING RECEPTACLES

Filed June 10, 1940

2 Sheets-Sheet 1

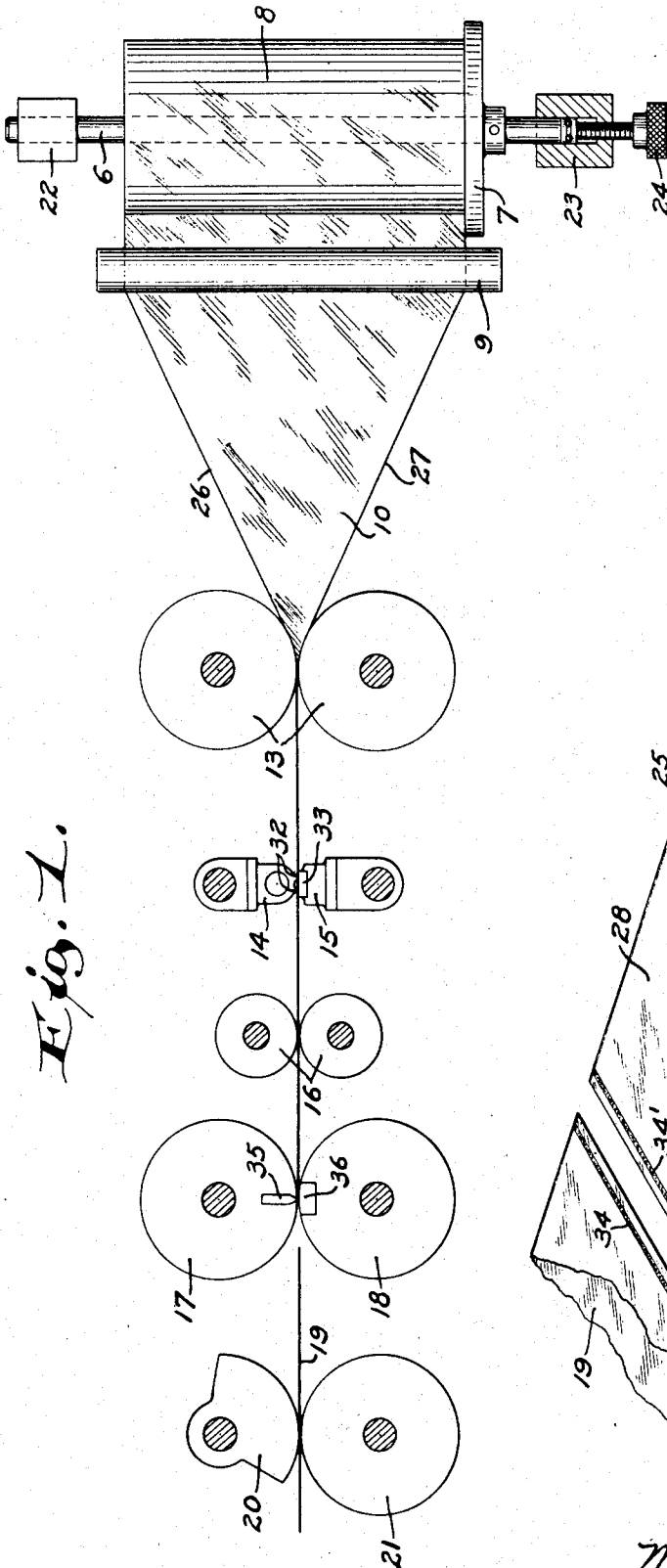


Fig. 1.

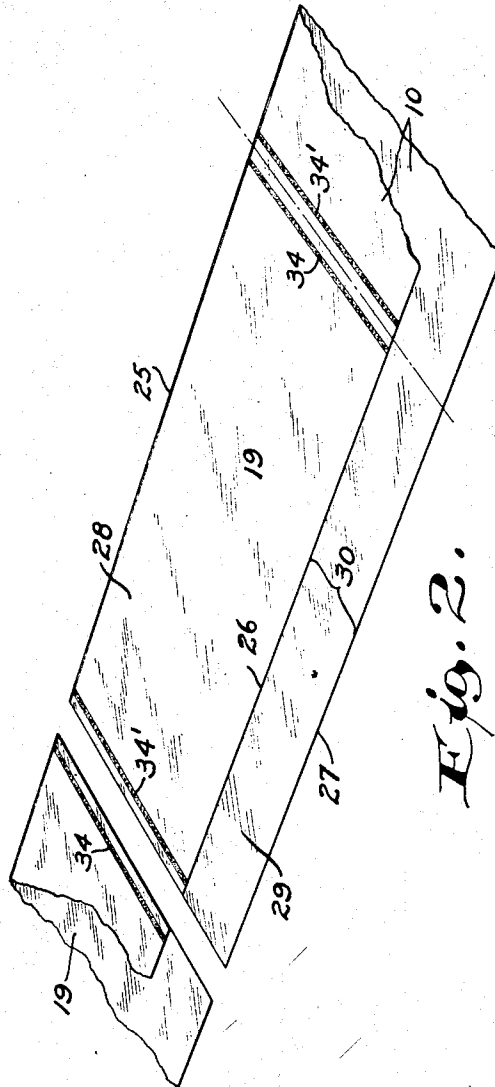


Fig. 2.

INVENTOR
C. K. Billeb
BY
Morsell, Lieber & Morsell
ATTORNEYS.

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2 Sheets-Sheet 2

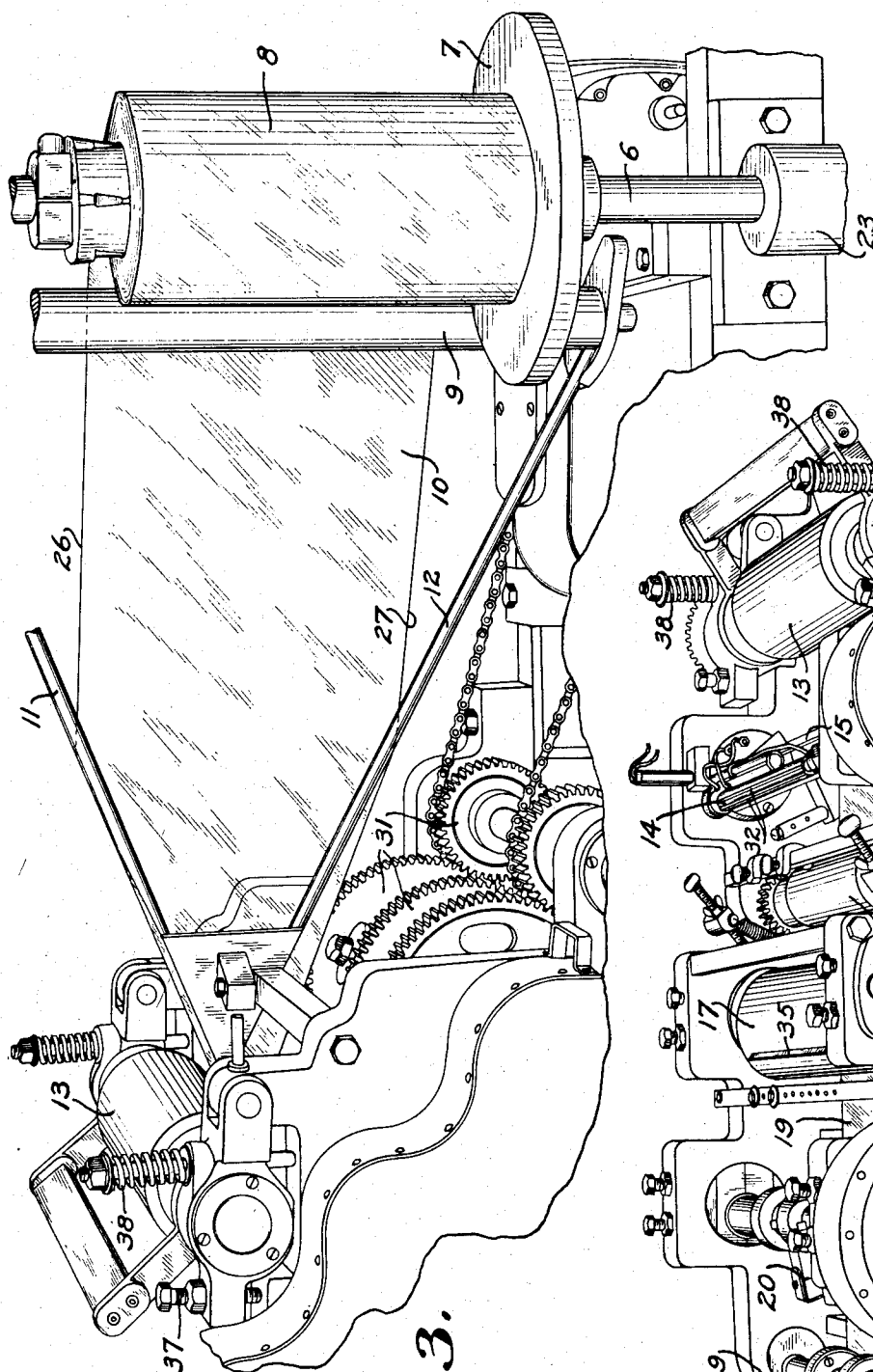


Fig. 3.

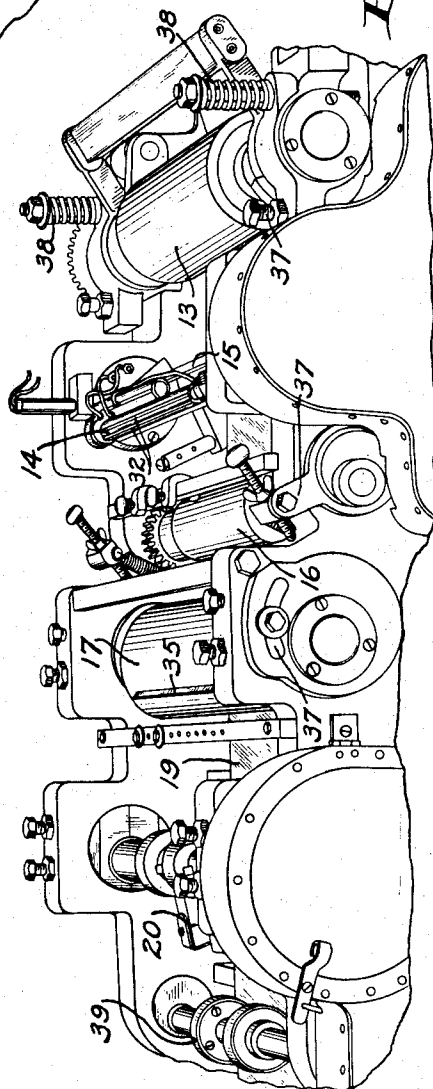


Fig. 4.

INVENTOR
C. K. Billeb
BY
Morsell, Lieber & Morsell
ATTORNEYS.

UNITED STATES PATENT OFFICE

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ART OF PRODUCING RECEPTACLES

Clyde K. Billeb, Shorewood, Wis., assignor to Mil-
print, Inc., Milwaukee, Wis., a corporation of
Delaware

Application June 10, 1940, Serial No. 339,681

5 Claims. (Cl. 93—20)

The present invention relates in general to im-
provements in the art of producing receptacles,
and relates more specifically to an improved
method of and means for manufacturing bags or
pouches from a continuously advancing web of
relatively thin sheet material.

An object of the invention is to provide an im-
proved method of producing bag-like receptacles
from a longitudinally advancing web of relatively
thin and flexible sheet material, in an expeditious
and efficient manner.

Many different methods and machines have
heretofore been utilized with varying degrees of
success, for the purpose of manufacturing bags
and pouches from constantly advancing ribbons
or webs of sheet material such as tissue or
glassine paper, regenerated cellulose, and sta-
bilized rubber hydrochloride. With these prior
bag forming processes and mechanisms, the web
of stock is usually folded and glued into tubular
formation while travelling longitudinally, and
successive sections are severed from the tube and
have an end thereof closed in any suitable man-
ner to complete the bags. This procedure pro-
duces bags or pouches each having a bottom seam
and another seam extending from the mid-portion
of the bottom to the top centrally of one of
the side walls, and also requires two separate and
individual operations to form the two seams.
While this type of receptacle is suitable for some
uses, it is objectionable for other purposes, and
the time required to perform the two independent
operations slows up the rate of production. It is
also frequently desirable to produce bags or
pouches of this kind, wherein the front and rear
walls are of different length or height measured
from the bottom edge of the receptacle, so that
more or less of a projection is formed on one
wall which may be lapped over the adjacent free
edge of the shorter wall when closing the pack-
age, and such pouches heretofore required the
use of complicated mechanisms for their pro-
duction especially if the size of the projection
was to be varied throughout a considerable
range.

It is therefore an object of my present inven-
tion to provide a new and useful method of manu-
facturing bags or pouches from sheet stock,
whereby the total number of operations are re-
duced to a minimum, by simultaneously sealing
the corresponding ends of adjoining successive
bags and by severing the stock medially of the
sealed areas, thus requiring only one operation to
seal the bottoms or the adjacent sides of two ad-
joining receptacles.

Another specific object of my invention is to
provide an improved method of varying the rela-
tive lengths or heights of the rear and front walls
of bags or pouches produced from a rapidly ad-
vancing ribbon or web of sheet stock.

A further specific object of the invention is to
provide a method of rapidly and effectively pro-
ducing a succession of pouches which are seamed
only at their opposite sides, and which are devoid
of seams at the bottom and intermediate their
sides.

An additional specific object of this invention is
to provide simple and efficient apparatus for au-
tomatically producing improved bags or pouches
from relatively thin sheet stock and in rapid
succession.

Still another specific object of the present in-
vention is to provide a compact and durable ma-
chine for quickly forming successive pouches
from a rapidly advancing web of sheet material
such as glassine paper, "Cellophane," "Pliofilm,"
or the like, and wherein the relative length or
heights of the walls of each pouch may be varied
without necessarily interrupting the operation
of the machine.

These and other objects and advantages of the
invention will be apparent from the following
detailed description.

A clear conception of the steps of my im-
proved method and of the construction and op-
eration of mechanism for facilitating commer-
cial exploitation thereof, may be had by referring
to the drawings accompanying and forming a
part of this specification wherein like reference
characters designate the same or similar parts
in the various views.

Fig. 1 is a diagram showing a skeleton of the
apparatus for carrying on my improved bag or
pouch making method;

Fig. 2 is a perspective view of one complete
pouch and of portions of two adjacent pouches;

Fig. 3 is a perspective view of the initial supply
and folding portion of the pouch making appa-
ratus; and

Fig. 4 is a perspective view of the heat sealing
and cutting portion of the pouch making mech-
anism.

While the invention has been shown and de-
scribed herein as being especially adapted for the
production of pouches for packing cheese or the
like, and formed of a web of thin transparent
sheet material such as "Cellophane" or "Plio-
film," it is not my desire or intent to thereby
unnecessarily restrict the scope or utility of the
improvement.

Referring to the drawings, the improved mechanism for carrying on my present improved method of making receptacles, comprises in general, a vertically adjustable rotary spindle 6 having thereon a platform 7, both adapted to support a supply roll 8 of printed or plain web stock in approximately upright position; a guide roll 9 coaxing with the advancing web 10 as it leaves the supply roll 8, and having a pair of oppositely inclined web folding rods 11, 12 diverging from the opposite ends thereof; a set of upper and lower draw rolls 13 adapted to coact with the web 10 after it has been longitudinally folded by the rods 11, 12; upper and lower revolving and cooperating heat sealers 14, 15 respectively, adapted to intermittently coact with the folded web 10 after leaving the draw rolls 13; a set of guiding and feeding rollers 16 coaxing with the advancing folded and transversely sealed web 10 after it leaves the zone of action of the sealers 14, 15; a pair of cooperating cut-off rolls 17, 18 adapted to subsequently coact with the folded and locally sealed web 10 after it passes the rollers 16, to cut the web 10 into successive pouches 19; and a breaker element 20 coaxing with a roller 21 and with the successive pouches 19 to quickly remove the finished articles from the machine.

The mill or supply roll supporting spindle 6 may be mounted for rotation in upper and lower bearings 22, 23 respectively, and this spindle 6 together with its platform 7 may be adjusted vertically by means of a set screw 24 to vary the position of contact of the web 10 with the fixed guide rods 11, 12. If the position of the supply roll 8 is such, that the web 8 contacts the rods 11, 12 equidistant from the apex of the triangle formed by these rods, then the web will be folded along a line 25 which is midway between its opposite edges 26, 27, and both the front wall 28 and the rear wall 29 will be of the same height or length measured from the fold line 25, see Fig. 2. If the web supply roll 8 is lowered so that the lower edge 27 of the web 10 is folded about the lower inclined rod 12 before the upper edge 26 reaches the upper inclined rod 11, then the fold line 25 will be off-center as in Fig. 2, and the front or top wall 28 will be of less width or height than the rear or lower wall 29, and a projection 30 will be formed on the rear wall 29 of each pouch 19. The size of this projection 30 may be varied by varying the extent of lowering of the roll 8; and if the supply roll 8 is elevated instead of lowered from mid position, then the projection 30 will be formed on the upper or front wall 28 instead of on the lower or rear wall 29 of each pouch 19. The supply roll 8 may obviously be thus vertically adjusted by manipulation of the adjusting screw 24, while the machine is operating and web 10 is being withdrawn from the supply roll 8.

The draw rolls 13 and the feed rolls 16 are continuously rotatable in unison, but at selected speeds, by means of gearing 31, and the sealers 14, 15 which are heated electrically are revolvable at uniform speed by the same gearing. If the speed of the rolls 13, 16 is reduced, the web 10 will be advanced at a slower rate of speed than if the rolls 13, 16 are speeded up, and in this manner the length or width of the pouches 19 may be varied throughout a considerable range. The upper sealer 14 is provided with a pair of parallel ridges 32 which are cooperable with an elongated anvil 33 on the lower sealer 15, to produce transverse laterally spaced par-

allel heat seals 34, 34' on the folded ribbon or web 10; and the revolving cutter roll 17 is provided with a blade 35 which is cooperable with an anvil block 36 on the roll 18 and which is so timed that it will sever the advancing locally sealed web 10 between each set of complementary seals 34, 34', see Figs. 1 and 2. In this manner, adjacent ends of adjoining successive pouches 19 are simultaneously sealed during each revolution of the sealers 14, 15 and contacting thereof with the folded advancing web, and while heat sealing is possible with "Pliofilm," other types of sealing as by gluing, may be substituted, when heat sealing cannot be utilized.

The rolls 13, 16, 17, 18, the sealers 14, 15, and the breaker element 20 and roller 21 may be provided with adjusting mechanisms 37 and with tensioning springs 38 as shown generally in Figs. 3 and 4, for insuring proper cooperation thereof with the advancing web 10 and pouches 19; and the breaker element 20 and roller 21 are revolvable at such speed that they will quickly remove the finished pouches 19 from the zone of cutting. The machine may also be provided with one or more sets of bag or pouch advancing rollers 39 located beyond the breaker element 20, for finally discharging the completed pouches 19, and it has been found desirable to cover the cutter roll 17 with felt and to provide strands of tinsel or the like in order to release static electricity from the advancing web 10 and pouches 19. The gearing 31 and the various other elements of the mechanism may be driven from a common motor or other power source in any suitable manner, and while the sealers 14, 15 are shown as being electrically heated, these may be heated by steam or otherwise.

During normal operation of the improved machine in carrying on my improved process, the mechanism is being constantly operated to continuously revolve the rolls 13, 16, 17, 18, 21, 39, the sealers 14, 15, and the element 20, and the web 10 is being constantly withdrawn from the supply roll 8 and is being folded by the inclined rods 11, 12, and by the draw rolls 13 cooperating therewith. As the sealers 14, 15 engage the longitudinally folded web 10, they intermittently produce the local complementary seals 34, 34'. The feed rolls 16 then advance the locally sealed web 10 past the cutting mechanism, and the knife 35 cooperating with the anvil block 36 severs the advancing ribbon intermediate each complementary set of seals 34, 34', into successive completed pouches 19. These successive pouches 19 are rapidly withdrawn from the zone of severance by the element 20 and roller 21, and by the final rolls 39, and are delivered from the machine in stacked relationship. The web material may be printed in any suitable fashion before being delivered to the machine, and by vertically adjusting the spindle 6 and the mill roll supporting plate 7, any desired overlap 30 may be produced on each pouch 19. The length of the pouches 19 from one seal 34, to the other seal 34' may be varied by varying the speed of rotation of the rolls 13, 16, so that the process may be effectively utilized to produce pouches of different shapes and sizes.

From the foregoing detailed description it will be apparent that my present invention provides an improved process of producing successive receptacles or pouches 19, in a most expeditious and efficient manner. The characteristics of the successive pouches can be quickly altered to meet different conditions, and by providing comple-

mentary end seals 34, 34', only one sealing operation is required for each final pouch 19 since only half an operation is required for each end seal. The pouches 19 which are produced by the improved method, have no seams along the bottom edge 25 and likewise are unseamed between the opposite end portions. The seals 34, 34' provide the only seams, and the remainder of each bag or pouch is devoid of seams. The overlap 30 is useful for tucking purposes when utilizing the pouches 19 to wrap batches of cheese or similar material, and the projections 30 may be varied to suit different conditions by merely manipulating the adjusting screw 24, during continued operation of the machine. The severance of the web 10 between complementary seals 34, 34' is also of importance since it permits production of successive bags or pouches at maximum speed, and this feature may obviously be utilized even in cases where the pouches or bags are made from tubular web stock. In that case the bags may be formed with the bottom of one bag adjoining the bottom of the next bag, and in this manner the speed of production of such bags may be materially enhanced. The present invention has proven highly practical in actual commercial use, especially in connection with material such as "Pliofilm," but the process may obviously be utilized in conjunction with other sheet materials.

It should be understood that it is not desired to limit this invention to the exact steps of the process or to the precise details of construction of the apparatus, herein shown and described, for various modifications within the scope of the claims may occur to persons skilled in the art.

I claim:

1. In combination, an approximately upright shaft rotatably journaled in upper and lower guide bearings and supported to revolve upon a lower thrust bearing and having a platform rotatable therewith for rotatably supporting a roll of web stock embracing the medial portion of the shaft, means for withdrawing the web from said roll, a pair of round rods converging from the ends of said roll for folding the advancing web into a ribbon having confronting walls travelling in a plane transversely of the roll axis, and means for effecting vertical adjustment of said lower thrust bearing to shift said rotating shaft and roll along the common axis thereof and thereby vary the relative widths of said ribbon walls.

2. In combination, an approximately upright shaft rotatably journaled in upper and lower guide bearings and supported to revolve upon a lower thrust bearing and having a platform rotatable therewith for rotatably supporting a roll of web stock embracing the medial portion of the

shaft, a pair of coating rolls for withdrawing the web from said supply roll and for finally folding the advancing web into a ribbon having confronting walls travelling in a plane transversely of the shaft axis, a pair of circular rods converging from the opposite ends of said supply roll toward a point intermediate the ends of and midway between said folding rolls for gradually initially folding the advancing web, and means for effecting vertical adjustment of said lower thrust bearing to shift said rotating shaft and supply roll along the common axis thereof and thereby vary the relative widths of said ribbon walls.

3. In combination, means for rotatably supporting a roll of web stock with the roll axis approximately vertical, a pair of coating rolls for withdrawing the web from said supply roll and for finally folding the advancing web into a ribbon having confronting walls travelling in a plane transversely of the supply roll axis, a tension roller disposed parallel to and closely adjacent to the stock roll, a pair of round rods converging from the opposite ends of said tension roller toward a point intermediate the ends of and midway between said folding rolls for gradually initially folding the advancing web, and means for effecting vertical adjustment of said supply roll to vary the position of the web fold line.

4. In combination, means for rotatably supporting a roll of web stock, a pair of coating rolls for withdrawing the web from said supply roll and for finally folding the advancing web into a ribbon having confronting walls travelling in a plane transversely of the supply roll axis, a tension roller disposed closely adjacent to the stock supply roll, a pair of round rods converging from the opposite ends of said tension roller toward a point intermediate the ends of said folding rolls for gradually initially folding the advancing web, and means for effecting bodily adjustment of said supply roll to vary the position of the web fold line.

5. In combination, means for rotatably supporting a roll of web stock, a pair of coating folding rolls for withdrawing the web from said supply roll and for finally folding the advancing web into a ribbon having confronting walls travelling in a plane approximately perpendicular to the supply roll axis, a tension roller disposed closely adjacent to the stock supply roll and approximately parallel to the axis thereof, and a pair of round rods converging from the opposite ends of said tension roller toward a point intermediate the ends of said folding rolls for gradually initially folding the web.

CLYDE K. BILLEB.