June 28, 1960 J. R. BAUMGARTNER 2,942,765

CARTON BLANK FEEDING MECHANISM

Filed May 24, 1956 2 Sheets-Sheet 1

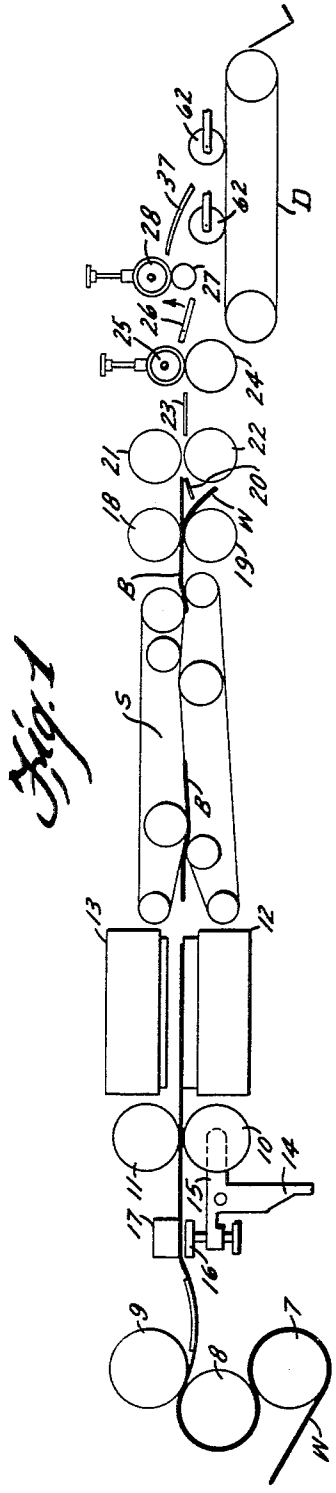


Fig. 1

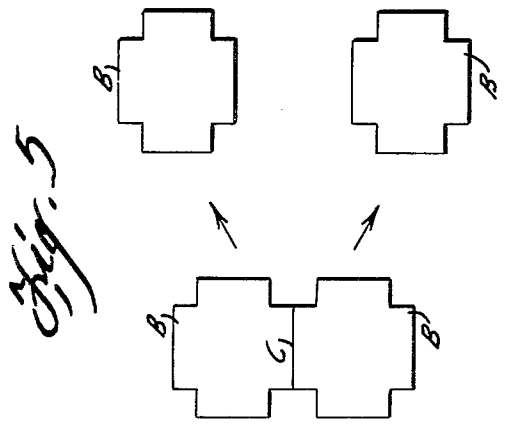


Fig. 3

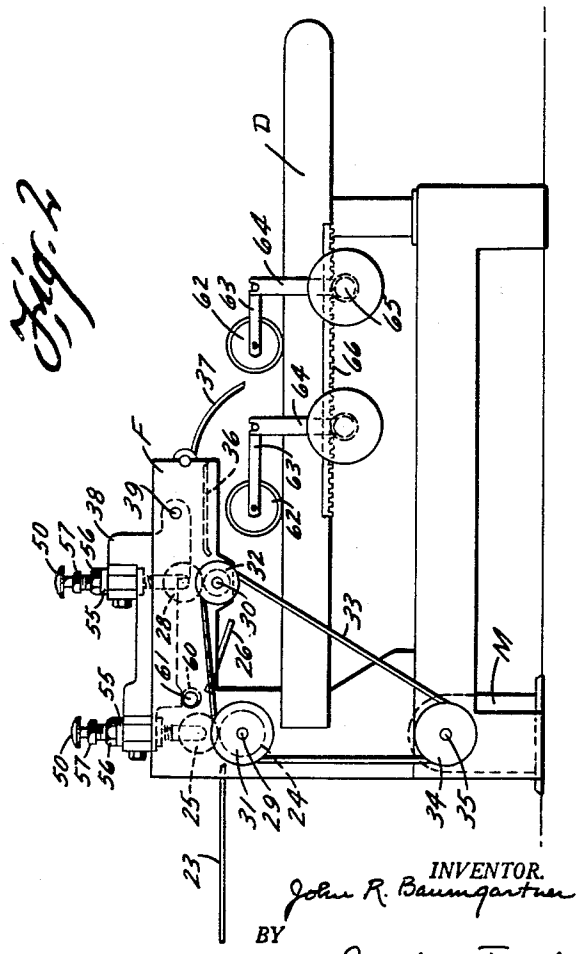


Fig. 2

INVENTOR.
John R. Baumgartner
BY
Charles & French
Attys

June 28, 1960 J. R. BAUMGARTNER 2,942,765

CARTON BLANK FEEDING MECHANISM

Filed May 24, 1956 2 Sheets-Sheet 2

Fig. 3

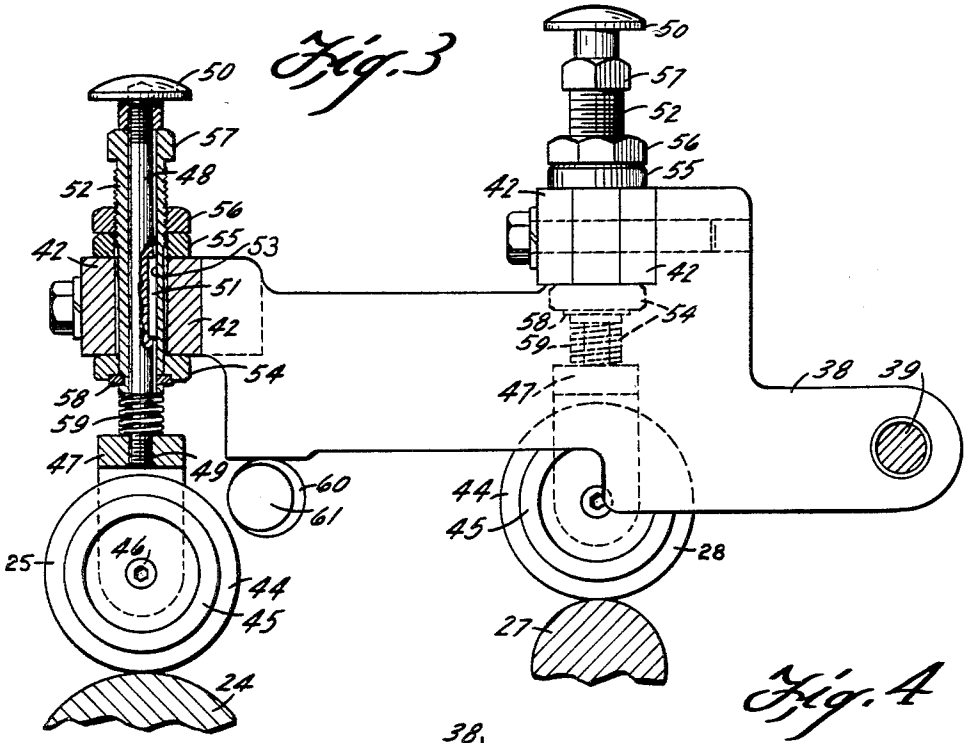
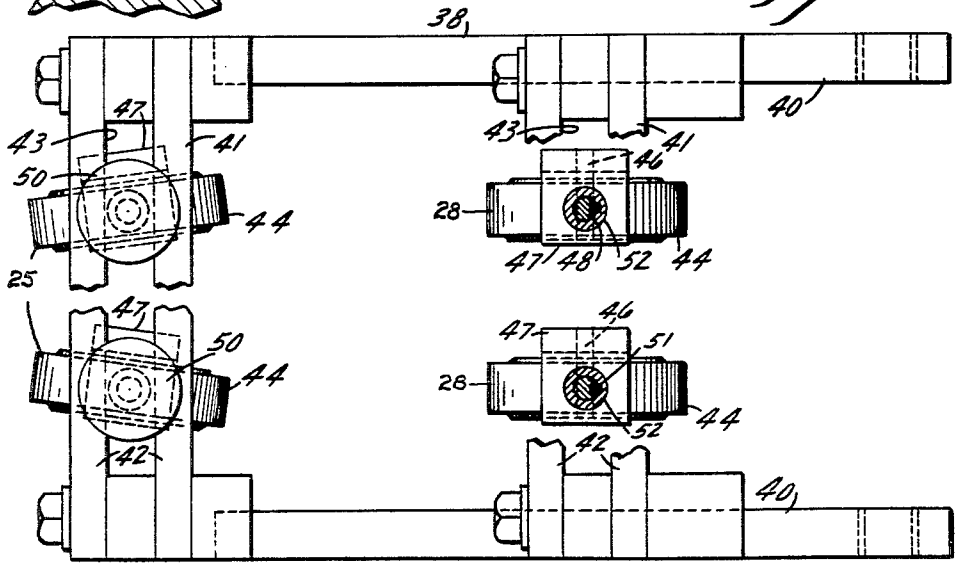


Fig. 4



INVENTOR.
John R. Baumgartner
BY
Charles & French
Attys.

United States Patent Office 2,942,765
Patented June 28, 1960

2,942,765

CARTON BLANK FEEDING MECHANISM

John R. Baumgartner, Milwaukee, Wis., assignor to Mercury Engineering Corporation, Milwaukee, Wis., a corporation of Wisconsin

Filed May 24, 1956, Ser. No. 586,984

6 Claims. (Cl. 225—94)

The invention relates to carton or box blank forming apparatus and more particularly to feed mechanism for separating multiple blanks from each other and delivering them to a delivery conveyor.

One object of the invention is to provide an additional set or sets of feed rollers between the last set of feed rolls and the delivery conveyor shown in my prior U.S. Letters Patent No. 2,655,842, dated October 20, 1953, for blank forming apparatus, this additional set or sets of feed rolls being used to cause a lateral separation of multiple cut blanks before such blanks are deposited on the delivery conveyor.

A further object of the invention is to provide a set or sets of feed rolls having a single lower drive roll and a series of smaller individual blank engaging rollers that may be adjusted at varying angles relative to said lower drive roll so as to exert a lateral thrust on a pair of blanks to separate them laterally into individual blanks before their delivery to the delivery conveyor. Each of the individual rollers are preferably rubber tired or faced rollers that are mounted on their support for angular adjustment and also adjustable spacing relative to each other, and this mounting is so constructed and arranged as hereinafter described to permit the individual adjustment of each roller to compensate for the wear of individual rollers.

The invention further consists in the several features hereinafter set forth and more particularly defined by claims at the conclusion hereof.

In the drawings:

Fig. 1 is a diagrammatic view of a blank forming apparatus embodying the invention;

Fig. 2 is a side elevation view of the feed roll section having features forming a part of the invention;

Fig. 3 is an enlarged sectional view of the feed mechanism embodying the invention, parts being broken away and parts being shown in section;

Fig. 4 is a plan view of structure shown in Fig. 3, parts being broken away;

Fig. 5 is a plan view of a pair of blanks before and after their separation of a set of feed rolls embodying the invention.

Referring to Fig. 1, the web W is fed from a supply roll (not shown) to a set of continuously rotating feed rolls **7**, **8**, and **9** and then to a pair of continuously driven intermittently active feed rolls **10** and **11** which rotate at a faster speed than that of the rolls **7**, **8**, and **9** and carry the web into the blanking press which includes a fixed platen **12** and a movable platen **13**, one of said platens carrying the blanking and forming dies and the other the counterplate therefor. For illustrative purposes only the roll **10** is shown mounted on a swinging support **14** having a crank arm **15** whose movement is controlled, for example, by mechanism shown in my prior U.S. Patent No. 2,638,821. Support **14** carries the movable member **16** of a brake **17** whereby on the swinging of said support to a position where the rolls **10** and **11** are operative to feed the web to the press, the brake is released as shown in Fig. 1, and on the swinging of said support to a position separating the rolls **10** and **11**, the brake will be applied as the blanking press is operated to cut the web.

After the blanks are cut by the press, the cut blanks, here multiple blanks, are fed out of the press into a stripper mechanism S which acts to separate the cut blanks B from the web as indicated in Fig. 1 and the left hand view of Fig. 5 and deliver them to a set of feed rolls **18** and **19** and then over a short table **20** to a set of feed rolls **21** and **22**. A further detailed showing and description of the parts above described will be found in my U.S. patents above identified, though other forms or types of stripping mechanism may be used without departing from the present invention. As shown, as the waste W is carried with the blanks past the feed rolls **18** and **19** and is allowed to drop down while the blanks are fed to the rolls **21** and **22**.

After leaving the rolls **21** and **22**, the multiple blanks B stripped of their waste are still held together by a cut line C and are carried over a table **23** into the bight of another set of feed rolls.

This last named set of feed rolls comprises a lower long power driven roll **24** extending transversely of the machine and a series of narrow rollers **25** which cooperate with said roll **24** to tear the blanks B apart along the cut line C and feed them to the upper run of an endless delivery conveyor D which is suitably driven by a belt (not shown) operatively connected with power take off of the machine as shown, for example, in connection with a similar conveyor in my Patent No. 2,655,842 above referred to.

While a single set of the feed rolls above described may be used in some instances, it is desirable in other instances to provide an additional set of feed rolls and an oscillatory diverter **26** between said sets of rolls so that some blanks may be delivered directly to the delivery conveyor from the first set of rolls, and other blanks may be delivered from the first set of blank separator rolls to the second set of rolls and then to the conveyor.

The second set of feed rolls comprises a long lower power driven roll **27** extending transversely of the machine and a series of narrow rollers **28** which cooperate with the roll **27** to feed the separated blanks B from the first set of rolls and, if desired, to further separate the blanks passing between the roll **27** and rollers **28** from each other before their delivery to the delivery conveyor.

Referring to Fig. 2, the shafts **29** and **30** for the rolls **24** and **27** are each suitably journalled in the frame F of the machine. The shaft **29** carries a pulley **31** and the shaft **30** carries a pulley **32**, these pulleys being connected together by a belt **33** driven by a pulley **34** on the shaft **35** of an electric motor M. The frame carries guides **36** and **37** to guide finished blanks from the second set of rolls onto the delivery conveyor. An auxiliary frame **38** is mounted to swing on a shaft **39** extending transversely of the main frame F. Frame **38** includes side frame members **40** and spaced sets **41** of transverse frame bars **42**. The bars **42** of each set of bars are spaced apart to form a transversely extending channel **43**.

Each of the rollers **25** or **28** has a rubber or yieldable tread portion **44** and a metal hub **45** suitably journalled on an axle pin **46** carried by the spaced arms of a fork **47**. The shaft **48** has a fixed threaded connection at its lower end **49** with the fork **47** and an adjustable threaded connection at its upper end with the hub of a hand knob **50** and has a key **51** mounted in it. A sleeve **52** surrounds a portion of the shaft and is provided with a key way **53** slidably engageable with the key **51**.

A washer **54** is mounted on the lower end of the sleeve **52** and held thereto by a retainer ring **58**. A washer

55 is mounted on the sleeve and engaged by a nut 56 in threaded engagement with the upper threaded end of the sleeve. The washer 54 abuts the lower sides of the set of spaced bars 42 and the washer 55 the top side of these bars, and these washers are clamped against these surfaces by the turning down of the nut 56, and since the sleeve 52 is free to slide in the channel 43, it and consequently the roller 25 or 28 may be clamped in any desired position along the length of the channel. At the same time the sleeve may be angularly adjusted or skewed with the aid of the wrench engaging portion 57, while it is being clamped down, to set the roller 25 or 28 at an angle to a straight line movement of a blank as indicated in Fig. 4. A stiff spring 59, surrounding the lower end of the shaft 48, is interposed between the lower end of the sleeve 52 and the fork 47. The loading of this spring is such that it causes the roller assembly to move with the frame 38 as a unit, yet on the turning of the hand knob 50 it permits downward movement of the shaft 48 relative to the sleeve 52 and the frame 38 to compensate for the tread wear of the roller 25 or 28.

With the above construction each of the rollers 25 or 28 are individually mounted on the frame 38 for transverse adjustment and angular adjustment relative thereto, and each roller is individually adjustable toward or away from said frame. The weight of the frame 38 acts to hold the rollers 25 and 28 in nipping engagement with their associated roller 24 or 27. The rollers 25 and 28 may be raised out of such engagement by raising the frame 38 by means of an oscillatory eccentric 60 on a transversely extending shaft 61.

Transverse adjustment of the rollers on the frame permits each roller to be set to engage a single blank, and the angular or skewing adjustment of the rollers acts to separate the blanks B from each other along the crease line C as said blanks travel between said rollers and the lower roller, this skewing in the case of a pair of blanks being in opposite directions as shown in Fig. 4 so that one of the blanks is pulled toward one side of the machine and the other pulled toward the other side. The rollers 28 may be similarly skewed but at a less angle, if desired.

The sepaarted finished blanks are delivered by the sets of rolls 25, 24 and 27, 28 to the delivery conveyor D.

For holding the delivered blanks down on the conveyor weights in the form of metal rollers 62 mounted on frames 63 pivoted on uprights 64 which are lengthwise adjustable through pinions 65 and a rack 66 similar to the roller unit shown in detail in Patent No. 2,655,842 may be used.

I desire it to be understood that this invention is not to be limited to any particular form or arrangement of parts except in so far as such limitations are included in the claims.

What I claim as my invention is:

1. In a carton blank forming apparatus for handling multiple blanks cut from a section of a web of stock, the combination with feed means for advancing blanks in multiple and a delivery mechanism for the finished blanks, of a lower power driven roller, and a series of upper relatively narrow rollers cooperating with said single roller and driven by the periphery thereof to advance the blanks from said feed means to said delivery mechanism, a main support, a support for each upper roller, means for clamping said roller supports to said main support in adjustably spaced relation to provide an upper roller in contact with each blank of said multiple blanks and means for angularly adjusting said roller supports and hence said upper rollers relative to said main support to cause a lateral separation of the blanks as they move over said single roller, and means for individually adjusting each of said upper roller supports vertically relative to said main support.

2. In a carton blank forming apparatus for handling multiple blanks cut from a section of a web of stock having a delivery mechanism for the finished blanks, feed mechanism for feeding finished blanks to said delivery mechanism comprising, in combination, a transversely extending lower power driven roller, a series of upper relatively narrow rollers having a yieldable tread surface, one roller for each blank, cooperating with said lower roller, a support for each roller including a shaft, and a sleeve surrounding said shaft, a transverse support having a transversely extending slot to receive the sleeve of said rollers, means for clamping each sleeve to said transverse support in the desired spaced relation relative to other sleeves, said clamping means engaging opposite sides of said support and permitting angular adjustment of said sleeves relative to said slot, and means for adjusting each shaft longitudinally of its sleeve to compensate for the wear of its tread surface.

3. In a carton blank forming apparatus for handling multiple blanks cut from a section of a web of stock having a delivery mechanism for the finished blanks, feed mechanism for feeding finished blanks to said delivery mechanism comprising, in combination, a transversely extending lower power driven roller, upper relatively narrow spaced rollers having a yieldable tread surface, one roller for each blank, cooperating with said lower roller, a support for each roller including a shaft and a sleeve surrounding said shaft and slidably keyed thereto, a spring normally acting to move said shaft lengthwise of said sleeve, a manually operable member connected to said shaft and engageable with said sleeve to determine the extent of relative lengthwise movement of said shaft by said spring, a main support for said rollers, and means at opposite end portions of each sleeve acting to clamp the same to said support both angularly and laterally thereof.

4. In a carton blank forming apparatus for handling multiple blanks cut from a section of a web of stock and having a delivery mechanism for finished blanks, a main frame having first and second spaced apart lower feed rolls, means to drive said lower rolls, a blank diverter shiftably mounted on said main frame between said lower rolls for diverting blanks from said first lower roll alternately to said mechanism and said second lower roll, an auxiliary frame shiftably mounted on said main frame and above said lower feed rolls, and two series of upper narrow rollers mounted on said auxiliary frame, each series cooperating with a corresponding lower roll and driven thereby, said auxiliary frame being so mounted that its weight holds said upper rollers in contact with their respective lower roll.

5. In a carton blank forming apparatus for handling multiple blanks cut from a section of a web of stock and having a delivery mechanism for finished blanks, a main frame having first and second spaced apart lower feed rolls, means to drive said lower rolls, a blank diverter shiftably mounted on said main frame between said lower rolls for diverting blanks from said first lower roll alternately to said mechanism and said second lower roll, an auxiliary frame shiftably mounted on said main frame and above said lower feed rolls, two series of upper narrow rollers mounted on said auxiliary frame, each series cooperating with a corresponding lower roll and driven thereby, said auxiliary frame being so mounted that its weight holds said upper rollers in contact with their respective lower roll, and means for angularly adjusting said upper rollers in respect to the direction of blank travel whereby one series of upper rollers can be adjusted to a different angle than the other series of rollers.

6. In a carton blank forming apparatus for handling multiple blanks cut from a section of a web of stock and having a delivery mechanism for finished blanks, a main frame having first and second spaced apart lower feed rolls, means to drive said lower rolls, a blank diverter shiftably mounted on said main frame between said lower rolls for diverting blanks from said first lower roll alter-

nately to said mechanism and said second lower roll, an auxiliary frame shiftably mounted on said main frame and above said lower feed rolls, two series of upper narrow rollers mounted on said auxiliary frame, each series cooperating with a corresponding lower roll, means for resiliently urging said upper rollers against their respective lower roll, means for individually adjusting each of the upper rollers with respect to its lower roll, said auxiliary frame being so mounted that its weight holds said upper rollers in contact with their respective lower roll,

and means for angularly adjusting said upper rollers in respect to the direction of blank travel whereby one series of upper rollers can be adjusted to a different angle than the other series of rollers.

References Cited in the file of this patent

UNITED STATES PATENTS

2,461,376	Feldmeier	Feb. 8, 1949
2,655,842	Baumgartner	Oct. 20, 1953
2,682,208	Monroe et al.	June 29, 1954