Feb. 4, 1964 I. S. GOTTSCHO ETAL 3,120,176

CARTON MARKING MACHINES

Filed July 28, 1961 4 Sheets-Sheet 1

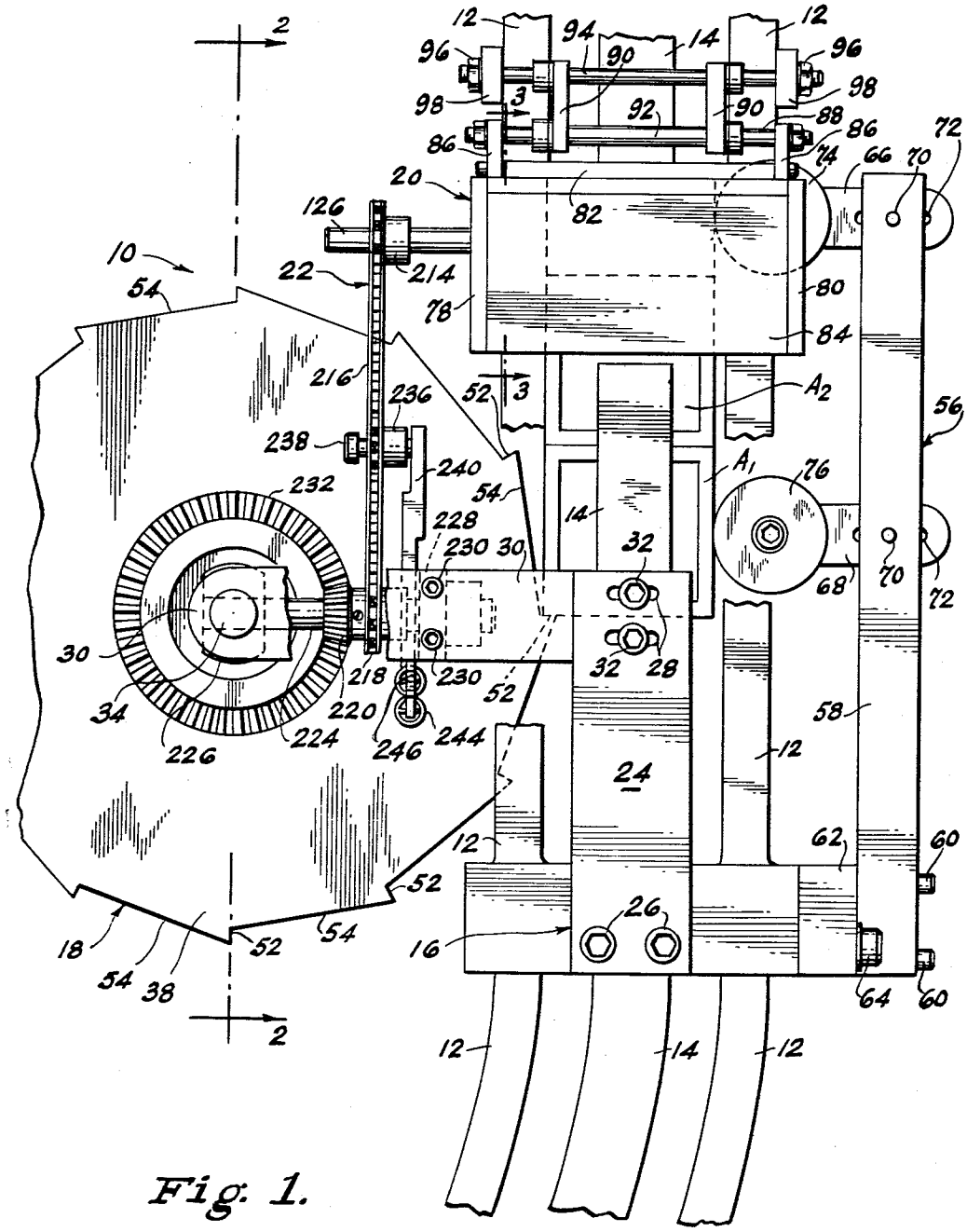


Fig. 1.

INVENTORS
IRA S. GOTTSCHO
AND LAWRENCE J. TALARICO
BY
Ogk Montgomery
ATTORNEY

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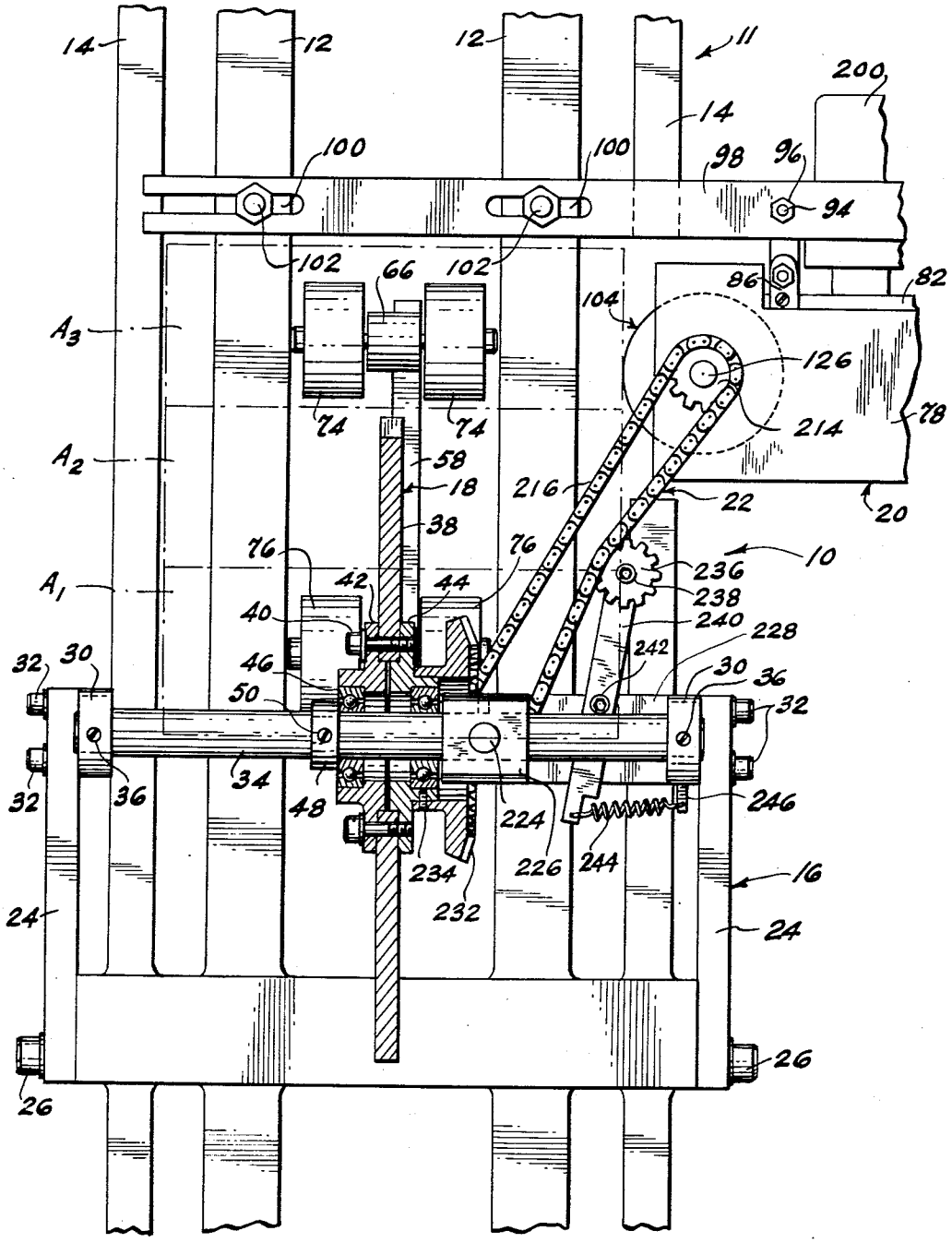


Fig. 2.

INVENTORS
IRA S. GOTTSCHO
AND LAWRENCE J. TALARICO
BY
Ralph Montgomery
ATTORNEY

Feb. 4, 1964 I. S. GOTTSCHO ETAL 3,120,176

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Fig. 3.

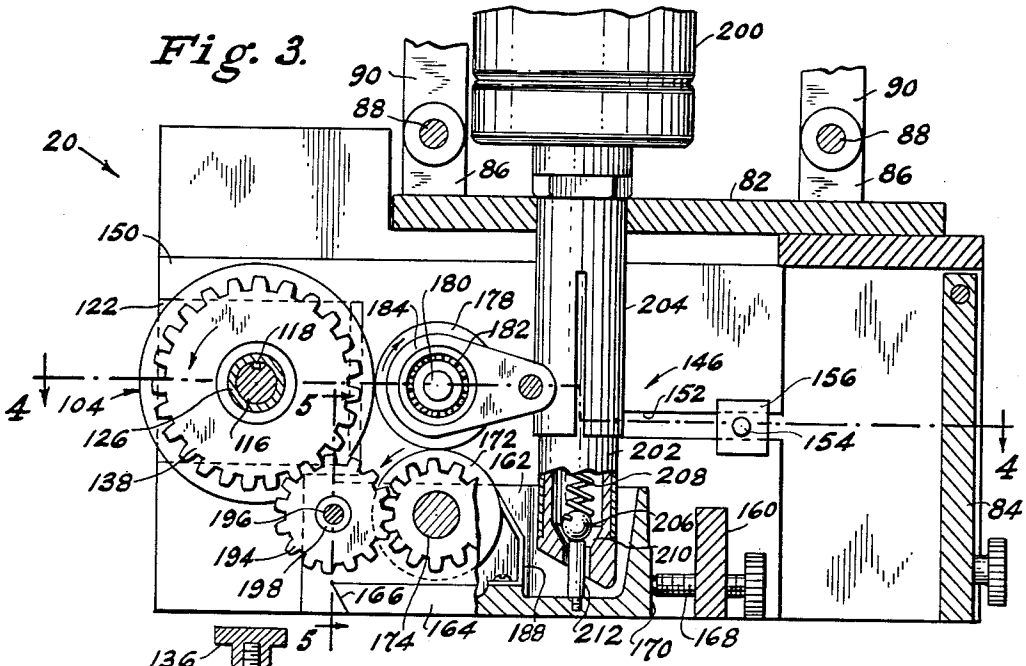


Fig. 4.

INVENTORS
IRA S. GOTTSCHO
AND LAWRENCE J. TALARICO
BY
ATTORNEY

Feb. 4, 1964 I. S. GOTTSCHO ETAL 3,120,176

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Filed July 28, 1961 4 Sheets-Sheet 4

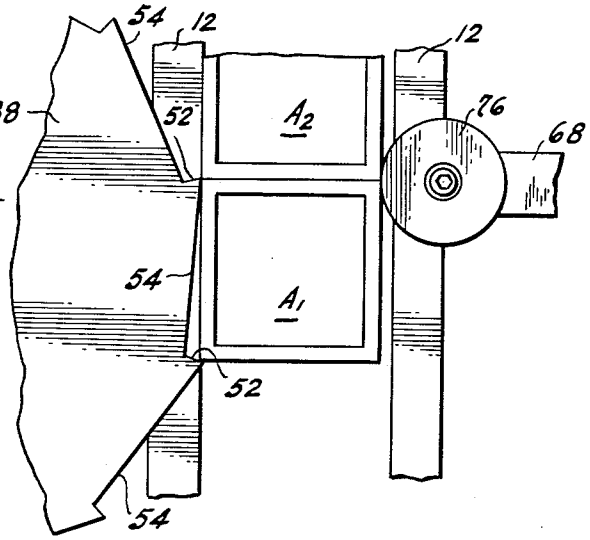


Fig. 6.

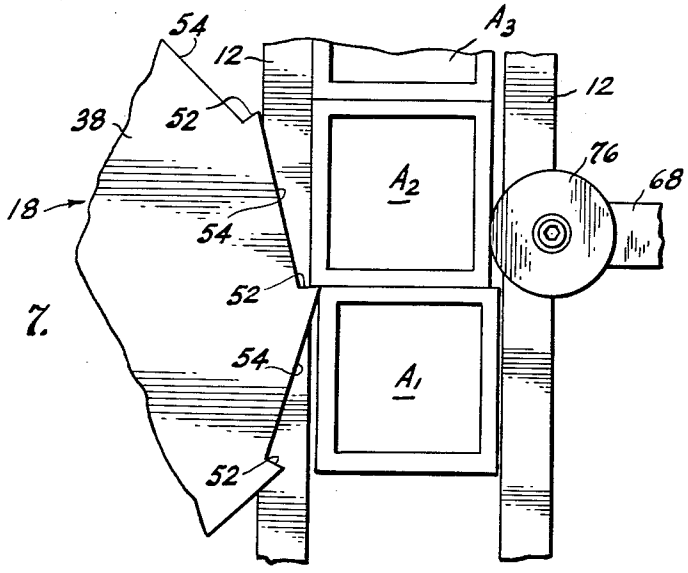
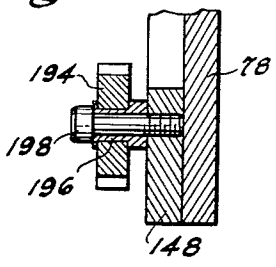


Fig. 7.

Fig. 5.



INVENTORS
IRA S. GOTTSCHO
AND LAWRENCE J. TALARICO
BY
J. L. Montgomery
ATTORNEY

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3,120,176

CARTON MARKING MACHINES

Ira S. Gottscho, Millburn, and Lawrence J. Talarico, South Plainfield, N.J., assignors to Adolph Gottscho, Inc., Hillside, N.J., a corporation of New York

Filed July 28, 1961, Ser. No. 127,666
5 Claims. (Cl. 101—37)

This invention relates generally to marking machines, and more particularly is directed to a machine for applying markings to cartons, boxes, or other articles having rectangular cross-sections, as such articles are conveyed by gravity along a path of travel which is vertical or at least at a substantial angle to the horizontal.

Machines exist for applying markings to cans, jars, bottles or other articles having circular cross-sections as such articles are conveyed past a marking station, and, in such existing machines, the conveyed articles drive a star wheel having semi-circular recesses in the periphery thereof for receiving the successive conveyed articles, and a marking apparatus including a die wheel having marking elements on the periphery thereof is provided with transmission means by which the die wheel is rotatably driven from the article rotated star wheel so that the marking elements are moved into rolling and marking contact with the successive conveyed articles in synchronism with the movement of the latter. However, when markings are to be applied to cartons, boxes or other articles having rectangular cross-sections and being conveyed by gravity along a vertical or other path at a substantial angle to the horizontal, the successive conveyed articles may be in contact with each other at their adjacent flat trailing and leading surfaces, respectively, so that there is no possibility of engaging such conveyed articles in the peripheral recesses of a conventional star wheel for driving the latter, and it has been the usual practice to provide other means, for example, an electric motor or the like, for driving the marking apparatus by which markings are applied to such conveyed articles. If the marking apparatus is driven by an electric motor or the like, relatively complex arrangements must be provided for synchronizing the rotation of the die wheel of the marking apparatus with the gravity induced movement of the successive articles along the vertical conveyor path.

Accordingly, it is an object of this invention to provide a machine for marking cartons, boxes or other articles having rectangular cross-sections as such articles are conveyed by gravity along a vertical or other path at a substantial angle to the horizontal, and wherein the marking device included in such machine is driven from a specially adapted star wheel which is rotated by the successive articles.

In accordance with an aspect of this invention, the machine for applying markings to articles having rectangular cross-sections as such articles are conveyed along a predetermined path, which may be vertical or at least at a substantial angle to the horizontal, comprises a star wheel rotatably mounted adjacent the path of travel of the articles and having a saw-tooth shaped periphery defining generally radial shoulders which are circumferentially spaced apart by distances substantially equal to the dimensions of the conveyed articles in the direction of movement of the latter along the path, and straight surfaces connecting the radially inner and outer ends, respectively, of adjacent shoulders, the star wheel being disposed so that the shoulders thereof project successively into the path of travel for driving engagement by the successive engaged articles, while the straight surface extending from the inner end of the shoulder being driven by an article acts against the latter in a direction at right angles to the direction of movement along the path, that

is, substantially horizontally in the case of a vertical conveyor path, to correspondingly offset such article relative to the next article along the path, whereby a corner portion of the leading surface of the next article is exposed for engagement with a shoulder of the star wheel, and marking means driven from the star wheel and operative, in response to rotation of the latter by the successive conveyed articles, to apply markings to the articles during movement of the latter along the path of travel.

In accordance with another respect of this invention, the marking machine further includes guide means disposed along a portion of the path of travel of the conveyed articles to constrain the latter against movement in the direction away from the star wheel and releasing each of the articles to permit the lateral movement of the latter away from the star wheel during the action of a straight peripheral surface of the latter against the article, with the marking means being disposed adjacent the portion of the path of travel of the conveyed articles where the latter are under the constraining influence of the guide means, thereby to avoid blurring of the markings applied to the articles by reason of lateral movements of the latter relative to the marking means during the marking operation.

A further object of the invention is to provide a marking machine of the described character having a marking device that includes a die wheel carrying marking elements on its periphery and being easily interchangeable for varying the circumference of the die wheel so as to adapt the machine for the marking of articles having different dimensions, particularly in the direction of movement thereof along the conveyor path, and wherein the marking device further includes an inking system for applying ink to the operative surfaces of the marking elements, with such inking system being easily adjustable for accommodating die wheels having different diameters in the marking device.

The above, and other objects, features and advantages of this invention, will be apparent in the following detailed description of an illustrative embodiment thereof which is to be read in connection with the accompanying drawings forming a part hereof, and wherein:

FIG. 1 is an elevational view which is partly broken away, and which illustrates a machine embodying the present invention for marking cartons, boxes or other articles having rectangular cross-sections, as such articles are conveyed by gravity along a vertical path of travel;

FIG. 2 is a sectional view taken along the line 2—2 on FIG. 1;

FIG. 3 is a vertical sectional view taken along the line 3—3 on FIG. 1, and showing the arrangement of a marking device included in the machine embodying this invention;

FIG. 4 is a horizontal sectional view taken along the line 4—4 on FIG. 3;

FIG. 5 is a detail sectional view taken along the line 5—5 on FIG. 3;

FIG. 6 is a detail view illustrating the drive engagement of an article with the star wheel in the machine embodying this invention; and

FIG. 7 is a detail view similar to that of FIG. 6, but showing the interaction of the star wheel and engaged article as the latter moves further along the path of travel.

Referring to the drawings in detail, and initially to FIGS. 1 and 2 thereof, it will be seen that a machine embodying the present invention for marking cartons, boxes or other articles having rectangular cross-sections is there generally identified by the reference numeral 10 and is shown associated with a conveyor or chute 11 through which successive articles, for example, as indicated at A_1, A_2 and A_3, are conveyed by gravity along

a path of travel which is vertical or at least at a substantial angle with respect to the horizontal. The conveyor or chute 11 may be made up of two pairs of elongated parallel side members 12 spaced apart by a distance greater than the lateral dimension of each article so that the latter can travel downwardly between the side members 12 with substantial clearance between the side surfaces of the successive articles and the constraining side members 12, as is apparent in FIG. 1, and the conveyor or chute 11 may further include elongated back and front members 14 extending parallel to the side members 12 and being spaced apart by a distance greater than the length of each article so that, as shown in FIG. 2, the successive articles can travel between the members 14 with substantial clearances between the end surfaces of each article and the front and back members 14 of the conveyor or chute. It will be apparent that the described conveyor or chute 11 defines an open-work structure through which the successive articles can fall along a substantially vertical path, and the machine 10 associated with the conveyor or chute 11 is intended to apply inked markings to an end surface of each of the successive articles during the movement of the latter along such path.

The machine 10 generally includes a frame structure 16 mounted on the conveyor or chute 11, a star wheel assembly 18 rotatably supported by the frame structure 16 and adapted to be rotatably driven by the successive articles during the movement of the latter downwardly within the conveyor or chute 11, a marking device 20 also supported from the conveyor or chute 11 and disposed to apply inked markings to an end surface of each of the successive articles, and transmission means 22 by which the marking device 20 is driven in response to rotation of the star wheel assembly 18 by the successive articles.

The frame structure 16 includes front and back uprights 24 secured at their lower ends, as by screws 26, to the front and back, respectively, of conveyor or chute 11 and each having a pair of laterally elongated, vertically spaced apart slots 28 (FIG. 1) adjacent its upper end. Elongated arms 30 extend laterally from the upper ends of uprights 24 and are secured to the latter by screws 32 extending through slots 28 so that arms 30 can be laterally adjusted relative to uprights 24. A horizontal axle 34 has its opposite ends secured, as by set screws 36 (FIG. 2), in suitable openings formed in the free end portions of arms 30, and the star wheel assembly 18 is rotatably mounted on the central portion of axle 34.

The star wheel assembly 18 includes a disk 38 clamped at its center, as by screws 40 (FIG. 2), between two hub parts 42 and 44 which are mounted on bearings 46 carried by axle 34 for rotation about the longitudinal axis of the latter. The star wheel assembly 18 is axially located along axle 34 between collars 48 suitably secured on axle 34, as by set screws 50.

As is apparent in FIG. 1, the disk 38 of star wheel assembly 18 has a saw-tooth shaped periphery defining radially extending shoulders 52 which are spaced apart circumferentially by distances substantially equal to the vertical dimension of each of the conveyed articles, that is, to the dimension of the latter in the direction of movement thereof along the conveyor or chute 11. Further, the saw-tooth periphery of disk 38 defines straight edge surfaces 54 connecting the radially inner and outer ends, respectively, of adjacent radial shoulders 52. The arms 30 of frame structure 16 are laterally adjusted relative to uprights 24 so that shoulders 52 of the star wheel assembly 18 successively project between the members 12 at one side of the chute or conveyor 11 and into the vertical path of travel of the conveyed articles, as is apparent in FIGS. 1, 6 and 7, so that the successive articles moving downwardly through conveyor or chute 11 engage successive shoulders 52 of the star wheel assembly and effect rotation of the latter.

As is apparent particularly in FIG. 1, during initial engagement of an article, for example, the article A_1, with a shoulder 52 of the star wheel assembly 18, the straight surface 54 extending from the inner end of the engaged shoulder is inclined more or less away from the adjacent side surface of the article A_1. As the article A_1 moves downwardly, for example, to the position shown in FIG. 6, the adjacent straight edge surface 54 of the star wheel assembly moves against the side surface of the article and, upon still further downward movement of the article, for example, to the position shown in FIG. 7, the straight edge surface 54 of the star wheel assembly acts laterally upon the article A_1 then in driving engagement with a shoulder 52 and laterally offsets such article relative to the article A_2 which is next above so that the corner portion of the leading or bottom surface of the article A_2 is thereby exposed for driving engagement with a shoulder 52 of the star wheel assembly then entering the vertical path of travel of the conveyed articles.

The fact that the lateral distance between the pairs of side members 12 of conveyor or chute 11 is greater than the lateral dimension of each of the conveyed articles provides the necessary clearance for permitting the lateral movement of each article by a straight edge surface 54 of the star wheel assembly, as described above. However, in order to ensure that the successive conveyed articles will be held against the pair of side members 12 adjacent star wheel assembly 18 as the articles successively move into engagement with the successive shoulders 52 of the star wheel assembly, the machine 10 further preferably includes a guide assembly 56 disposed at the side of the conveyor or chute 11 remote from star wheel assembly 18. As shown in FIG. 1, guide assembly 56 includes an upright 58 having its lower end secured, as by screws 60, to a cross member 62 which is secured, in turn, to the structure of conveyor or chute 11, as by screws 64. Upper and lower arms 66 and 68 are secured to upright 58 at vertically spaced apart locations along the latter, as by screws 70 which extend through elongated slots 72 formed in arms 66 and 68 adjacent one end of the latter so that the arms 66 and 68 can be adjusted toward and away from the path of travel of the conveyed articles along chute 11 and also angularly about the screws 70. The free ends of arms 66 and 68 carry pairs of rotatable rollers 74 and 76, respectively, which project between the adjacent pair of side members 12 for rolling engagement with the side surfaces of the articles, and the arms 66 and 68 are adjusted so that such rolling engagement will hold the successive articles against the opposite pair of side members 12 of chute 11, as is apparent in FIG. 1. Further, as is apparent in FIG. 6, the arm 68 carrying the lower pair of rollers 76 is vertically located so that the axis of the rollers 76 lies in a horizontal plane that is substantially at the level of the point where the radial shoulders 52 of star wheel assembly 18 initially enter the path of travel of the conveyed articles. Thus, rollers 76 ensure that each of the conveyed articles will properly effect initial engagement with the shoulder 52 of the star wheel assembly, and yet permit the lateral displacement of the article by a straight edge surface 54 of the star wheel assembly, as described above, so that a substantial area of contact will exist between the leading or bottom surface of an article and a shoulder 52 of the star wheel assembly during driving of the latter by an article.

The marking device or unit 20 forming part of the machine 10 is mounted in back of the conveyor or chute 11 substantially at the level of the upper guide rollers 74 so that the latter will act upon the successive articles to resist lateral shifting thereof during each marking operation, thereby to avoid blurring of the applied markings. The marking device or unit 20 includes a housing made up of side walls 78 and 80 (FIGS. 1 and 4) held in parallel, spaced apart relation by a top wall 82 and a

hinged back wall 84. The housing is suspended in its operative position by pairs of lugs 86 extending upwardly from the opposite side edges of its top wall 82 and being secured to the opposite ends of laterally extending shafts 88 (FIGS. 1 and 2). Links 90 are pivotally mounted, at their lower ends, on each shaft 88 and are held apart by a spacer tube 92 on the related shaft 88, while the upper ends of the links 90 are pivotally mounted on laterally extending shafts 94 having their opposite ends secured, as by nuts 96, in elongated horizontal arms 98 formed with elongated slots 100 (FIG. 2) receiving bolts 102 by which the arms 98 are secured to the side members 12 of conveyor or chute 11 while permitting adjustment of the position of the housing of marking device or unit 20 toward and away from the path of travel of the conveyed articles.

As is shown in FIGS. 3 and 4, the marking device or unit 20 further includes a die wheel assembly 104 rotatably mounted in side members 78 and 80 adjacent the front, open end of the housing. The die wheel assembly 104 includes a cylindrical body 106 having a radial flange 108 at one end and an opposite, externally threaded end portion 110 receiving a threaded locking ring 112 so that marking elements 114 may be suitably secured on the periphery of the die wheel assembly between flange 108 and locking ring 112. The cylindrical body 106 is mounted on a shaft 116 and rotatably coupled to the latter, as by a key 118. One end of shaft 116 is rotatably mounted in a bearing 120 held in a recess of side wall 80 by means of a removable bearing holder 122, while the opposite end portion of shaft 116 telescopes into an axial bore 124 provided in a drive shaft 126 which is rotatably mounted in a bearing 128 held in a recess of side wall 78 by a removable bearing holder 130 (FIG. 4). Shaft 116 is rotatably coupled to drive shaft 126, for example, by means of a pin 132 extending from shaft 126 into an axial slot 134 in shaft 116 so that the latter can be axially withdrawn from bore 124 by pulling on shaft 116 through a knob 136 secured on the end of the shaft projecting through side wall 80 of the housing. A gear 138 is secured on drive shaft 126, for example, by a set screw 140, and the body 106 is urged axially against the hub of gear 138 by a spring 142 acting, through a roller bearing 144 against the end of body 106 remote from gear 138.

The marking device or unit 20 further has an inking system 146 (FIGS. 3 and 4) for applying ink to the operative or raised surfaces of the marking elements 114 on die wheel assembly 104. The inking system 146 is movable horizontally, as a unit, within the housing of marking device 20 for accommodating die wheel assemblies of different diameters within the marking device. The inking system 146 includes side plates 148 disposed against the inner surfaces of side walls 78 and 80 and being slidably guided relative to the latter by means of forward extensions 150 (FIG. 3) slidable on the top surfaces of the bearing holders 122 and 130 and by slots 152 formed in side plates 148 and receiving bolts 154 which extend through side walls 78 and 80 and receive nuts 156 formed with rectangular projections 158 fitting in the slots 152 (FIG. 4). The side plates 148 are joined together by a cross bar 160 extending between the back end portions thereof so that the side plates 148 are adjustable horizontally as a unit relative to the housing of the marking device.

The inking system 146 further includes an ink fountain 162 opening upwardly and having wings 164 projecting laterally from the bottom thereof. The wings 164 are formed with downwardly and rearwardly beveled forward edges 166 (FIG. 3) and are received in correspondingly shaped cutouts (not shown) in the lower edges of side plates 148, with such cutouts being wider than the wings 164 so that the latter can be shifted rearwardly for disengaging the beveled front edges 166 of the wings from the correspondingly beveled front edges of the cutouts. The beveled edges 166 of wings 164 are normally held in engagement with the beveled edges of the related cutouts in plates 148 by a locking screw 168 extending through a tapped hole in cross bar 160 and bearing against a centrally located pad 170 extending from the back of ink fountain 162.

An ink roller 172 is mounted on a shaft 174 having its opposite ends journaled in bearings 176 mounted in side plates 148 so that the ink roller 172 dips into a supply of ink maintained in fountain 162. Mounted above ink roller 172, and in rolling contact with the surface of the latter, is a metering roller 178 provided with a shaft 180 having its opposite ends journald in bearings 182 carried by arms 184 which are pivotally mounted, by screws 186, against the inner surfaces of side plates 148 so that, by loosening the screws 186, arms 184 can be rocked to vary the contact pressure between the surfaces of inking and metering rollers 172 and 178. The side plates 148 are adjustably located, as described above, so that the front of metering roller 178 effects rolling contact with the marking element 114 on die wheel assembly 104, whereby metering roller 178 is operative to transfer ink from the surface of inking roller 172 to the marking elements. An ink scraper 188 is mounted within fountain 162 and engages the surface of inking roller 172 for removing excess ink therefrom.

The metering roller 178 is frictionally driven by its rolling contact with inking roller 172, while the latter is positively driven from the die wheel assembly 104 by means of a spur gear 190 fixed on the shaft 174 of the inking roller, as by a set screw 192 (FIG. 4), and meshing with an idler gear 194 (FIGS. 3 and 5) which is rotatable on a bearing 196 carried by a screw 198 engaged in a tapped hole of the adjacent side plate 148 and located so that the idler gear 194 meshes, in turn, with the gear 138 secured to the drive shaft 126 of die wheel assembly 104.

In order to maintain a substantially constant level of ink in fountain 162, the inking system 146 further includes an ink reservoir or tank 200 (FIG. 3) having an ink supply pipe 202 extending therefrom through a split tube 204 depending from the top wall 82 of the housing of marking device 20 for mounting the ink reservoir 200 in inverted position above top wall 82. The lower end of supply pipe 202 projects into fountain 162 and is provided with a ball valve 206 normally urged by a spring 208 against a valve seat 210 for closing the end of pipe 202 when tank or reservoir 200 is removed from the marking device. However, a pin 212 projects upwardly from the bottom of fountain 162 and unseats valve 206, as in FIG. 3, when reservoir or tank 200 is in its operative position on the marking device.

In accordance with the present invention, the die wheel assembly 104 of marking device 20, and hence also the inking roller 172 and the metering roller 178 of the latter, are rotatably driven from the star wheel assembly 18 through the transmission means 22 which includes a sprocket 214 (FIGS. 1, 2 and 4) secured on shaft 126 of the die wheel assembly and being driven by an endless chain 216 running therearound. Chain 216 also runs around a sprocket 218 (FIG. 1) which is rotatably coupled with a bevel gear 220 rotatable on an axle 224 extending horizontally at right angles to axle 34 and being supported, at its opposite ends, in a block 226 mounted on axle 34 and in an arm 228 (FIGS. 1 and 2) extending, at right angles, from one of the arms 30 of frame structure 16, and being secured to that one arm 30 by means of screws 230 (FIG. 1).

The bevel gear 220 meshes with a bevel gear 232 which is secured, as by a set screw 234 (FIG. 2), on the hub part 44 of star wheel assembly 18. Thus, bevel gear 232 rotates with the star wheel assembly and drives bevel gear 220 and sprocket 218 which is connected through chain 216 with the sprocket 214 on shaft 126 of the die wheel assembly 104.

In order to maintain the requisite tension in chain 216 while permitting lateral adjustment of the housing of marking device 20 for accommodating different diameter die wheel assemblies in the latter, transmission means 22 further includes a tensioning sprocket 236 freely rotatable on an axle 238 projecting from the upper end of an arm 240 which is pivotally mounted intermediate its ends, as at 242 (FIG. 2), on the support arm 228. The lower end of rockable arm 240 is connected to a tension spring 244 which is, in turn, connected to an anchor 246 depending from the adjacent arm 30 so that spring 244 urges arm 240 to rock in the direction pressing sprocket 236 against a run of chain 216.

It will be apparent that the circumference of die wheel assembly 104, at the operative surfaces of the marking elements carried thereby, is selected so as to be a whole multiple of the dimensions of the successive articles in the direction of movement of the latter along conveyor or chute 11. In the illustrated embodiment, the circumference of the die wheel assembly is twice the vertical dimension of the end surface of each article to be marked, and the ratio of the bevel gears 220 and 232 is selected so that the surface speed of the die wheel assembly 104 will be equal to the speed of vertical movement of the successive articles driving star wheel assembly 18, with the die wheel assembly effecting a complete revolution during the angular displacement of the star wheel assembly 18 by two successive articles.

When different sized articles are to be marked, the die wheel assembly is exchanged for one having a circumference which is a whole multiple of the vertical dimension of such articles at the surface to be marked, and the inking system 146 of marking device 20 is laterally shifted, in the manner previously indicated, so as to maintain rolling and ink transferring contact of the metering roller 178 with the marking elements and also to maintain meshing engagement of the idler gear 194 with the gear 138 of the new die wheel assembly. Further, the support arms 98 from which the marking device 20 is suspended are also laterally shifted so as to provide the necessary rolling and marking contact of the marking elements on the new die wheel assembly 104 with the surfaces to be marked on the successive conveyed articles.

It will be apparent that the machine 10 described above is operative to mark successive cartons, boxes or other articles having rectangular cross-sections while such articles are conveyed in contact with each other along a predetermined path of travel, with the operative power for the marking machine being derived from the driving engagement of the successive articles with the star wheel assembly 18.

Although an illustrative embodiment of the inevntion has been described in detail herein with reference to the accompanying drawings, it is to be understood that the invention is not limited to that precise embodiment, and that various changes and modifications may be effected therein without departing from the scope or spirit of the invention, except as defined in the appended claims.

What is claimed is:

1. The combination of conveyor means for transporting articles having rectangular cross-sections along a substantially vertical path of travel under the influence of gravity, a star wheel mounted adjacent said path for rotation about a horizontal axis in a plane perpendicular to one side of the articles moving along said path, said star wheel having a saw-tooth shaped periphery defining generally radial shoulders which are circumferentially spaced apart by distances substantially equal to the dimensions of the conveyed articles in the vertical direction of movement of the latter along said path, said periphery of the star wheel further having straight surfaces connecting the radially inner and outer ends, respectively, of adjacent shoulders, said star wheel being disposed so that said shoulders project successively into said vertical path for driving engagement by the lower surfaces of all of the successive articles falling along said path and being partly arrested by said driving engagement while said straight surface extending from the inner end of the shoulder in driving engagement with an article acts against the latter to shift such article laterally relative to the article next above, whereby a corner portion of the lower surface of said article next above is exposed for engagement with a shoulder of the star wheel, and marking means driven from said star wheel and located above said axis of the latter to apply markings to the articles moving along said path in response to rotation of said star wheel by the articles.

2. The combination of conveyor means for transporting articles having rectangular cross-sections along a substantially vertical path of travel under the influence of gravity, a star wheel mounted adjacent said path for rotation about a horizontal axis in a plane perpendicular to one side of the articles moving along said path, said star wheel having a saw-tooth shaped periphery defining generally radial shoulders which are circumferentially spaced apart by distances substantially equal to the dimensions of the conveyed articles in the vertical direction of movement of the latter along said path, said periphery of the star wheel further having straight surfaces connecting the radially inner and outer ends, respectively, of adjacent shoulders, said star wheel being disposed so that said shoulders project successively into said vertical path for driving engagement by the lower surfaces of all of the successive articles falling along said path and being partly arrested by said driving engagement while said straight surface extending from the inner end of the shoulder in driving engagement with an article acts against the latter to shift such article laterally relative to the article next above, whereby a corner portion of the lower surface of said article next above is exposed for engagement with a shoulder of the star wheel, guide means disposed at the side of said path opposed to said star wheel and engageable with the successive articles to constrain each of the latter against lateral movement prior to the engagement of a straight surface of said star wheel with the article, and marking means driven from said star wheel in response to rotation of the latter by the successive conveyed articles and located above said axis of the star wheel so as to be operative to mark the latter while the articles are engaged by said guide means so as to avoid blurring of the applied markings by lateral shifting of the articles.

3. The combination as in claim 2; wherein said guide means includes rollers at vertically spaced apart locations, the lowermost of said rollers having its axis lying in a horizontal plane above said axis of the star wheel and which passes substantially through the point where said shoulders of the star wheel enter said path of travel of the articles.

4. The combination as in claim 3; further comprising mounting means for said rollers including a vertical support fixed relative to said conveyor means, arms rotatably carrying said rollers, and means securing said arms to said fixed support and permitting adjustment of said arms toward and away from said path of travel and also angularly in a vertical plane for varying the lateral positions of said rollers and the vertical locations of the latter along said path.

5. A machine for applying markings to articles having rectangular cross-sections as such articles move downwardly along a substantially vertical path of travel; said machine comprising a star wheel having a saw-tooth shaped periphery defining generally radial shoulders spaced apart circumferentially by distances substantially equal to the dimensions of the articles in the direction of said path and a single straight edge surface connecting the radially inner end of each shoulder with the radially outer end of an adjacent shoulder, means for rotatably mounting said star wheel in a vertical plane so that said shoulders project successively into the path of travel

of the articles for driving engagement by all of the latter and the straight edge surface extending from the inner end of an engaged shoulder acts laterally against and offsets the engaged article relative to the article next above, thereby to expose a corner portion of said next article for engagement with a shoulder of said star wheel, and marking means driven from said star wheel in response to rotation of the latter to apply markings to the downwardly moving articles at a location along said path spaced upwardly from the axis of said star wheel.

References Cited in the file of this patent

UNITED STATES PATENTS

1,130,682	Augensen	Mar. 2, 1915
1,455,160	Yoshinaga	May 15, 1923
1,485,543	Aysong	Mar. 4, 1924
2,516,941	Babicz	Aug. 1, 1950
2,588,480	Burckhardt	Mar. 11, 1952
2,602,393	Hirschey	July 8, 1952
2,706,945	Burnett	Apr. 26, 1955
2,775,193	Mastella	Dec. 25, 1956