June 14, 1955 LE ROY STAUNTON ET AL 2,710,471

MAGNETIC LEAF TURNER FOR FLEXIBLE SHEET EXHIBITORS

Filed April 30, 1951

Fig. 1

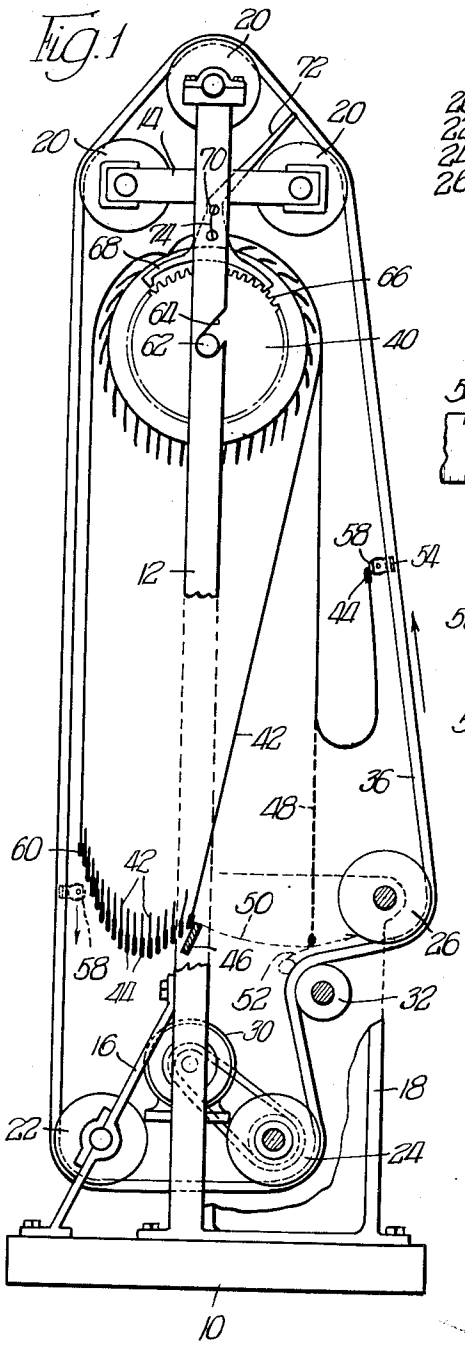


Fig. 3

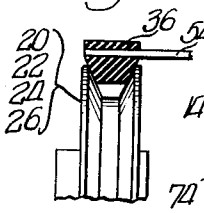


Fig. 4

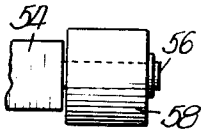


Fig. 5

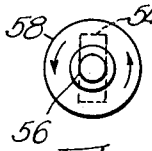


Fig. 6

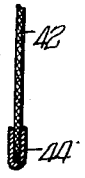
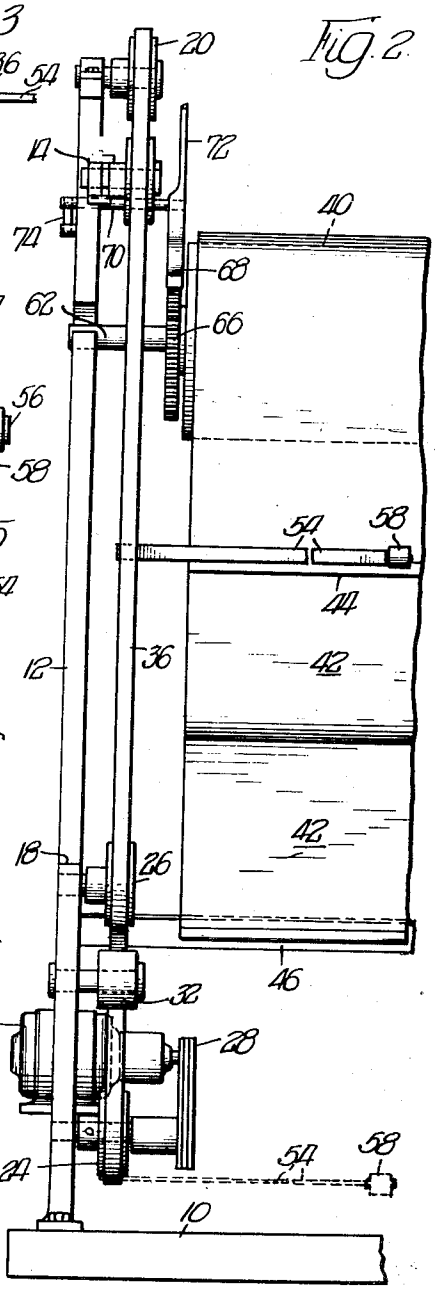


Fig. 2



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MAGNETIC LEAF TURNER FOR FLEXIBLE SHEET EXHIBITORS

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Application April 30, 1951, Serial No. 223,743

2 Claims. (Cl. 40—35)

This invention relates to flexible sheet exhibitors, and is especially concerned with the provision of a magnetic leaf turner for the type of flexible sheet magazine disclosed in the copending application of Le Roy Staunton, Serial No. 223,307, filed April 27, 1951. It is a continuation-in-part of the subject matter contained in another application of Le Roy Staunton, entitled Flexible Sheet Exhibitor, Serial No. 223,742, filed April 30, 1951.

In the copending applications above identified, there is shown a device for the display of wallpaper, fabric samples, or other advertising media, which are suspended from the periphery of a cylindrical drum. The sheets are turned by endless means passing in relation to the drum, and as each sheet passes from one side thereof to the other an increment of rotation is imparted thereto, which causes the next sheet to advance into the pick-up position.

In certain embodiments shown in the copending applications, an endless belt is caused to turn the sheets by frictional contact with a surface thereof, while in another instance the belt is provided with positive sheet-engaging means, which causes the lifting and turning of successive sheets into a position where they may fall by gravity into position upon the opposite side of the drum. The drum in all instances is mounted so as to be free to turn under the influence of the shifting weight of the sheets as the latter are passed from one side to the other thereof, unless controlled by an escapement mechanism provided to give a metering action in some of the embodiments. It is also provided that the drum be removably mounted in such an exhibitor so as to be replaceable to renew the display.

In the present instance, the flexible sheet exhibitor embodies a belt upon which permanent magnets are disposed for engagement with the bottom edge of each of the sheets to be turned, such edges being provided with a strip of magnetic material which is attracted and held by the magnets on the belt. The sheets are metered forward into pick-up position, where the bottom edge swings in an arc that falls substantially tangent to the arc through which the magnet is caused to travel at this point, whereupon the pick-up is effected gradually and with consonance between the two movements of the bodies concerned.

The present invention is especially adapted for the handling of wallpaper or other display fabrics which vary considerably in thickness and in the amount of surface coating and other surface conditions, such as embossing, which greatly affect the inclination of the sheets to bend and to slide one against the other. The present invention also finds applicability in the display of light fabrics which do not always have sufficient weight and body to hang wrinkle-free without the aid of some positive means to pull them tautly into a flat condition at the display point. These and other advantages will be brought out more fully hereinafter by reference to the accompanying specifications and drawings, to the latter of which reference is now made.

Figure 1 represents a side elevational view of one form of the invention shown with parts broken away in the interest of clarity;

Figure 2 is a fragmentary front view regarded from the right hand side of Figure 1;

Figure 3 is a fragmentary enlarged detail view of any one of the V-bolt pulleys showing the V-belt and the magnet holder in relation to the latter and to the pulley;

Figures 4 and 5 are fragmentary enlarged front elevation and end views, respectively, of the magnet arm and magnet; and

Figure 6 is a vertical sectional view taken through the bottom edge of one of the sheets dependent from the drum, and which has a magnetic strip or reinforcement along its bottom edge.

The device is mounted upon any suitable base **10**, on which are erected side frames **12**, only the left hand one of which is represented in the drawings. The frame is provided at its upper end with a crosshead **14**, and adjacent to the bottom with a brace **16** and a side bearing plate **18**, all of which are joined to the side frame **12** in any suitable manner to afford a rigid support.

A plurality of V-pulleys **20** occur at the upper end of the frame, one of which is disposed in bearings on top of the side frame **12**, and the others of which are suitably mounted at the ends of the crosshead **14**.

At the lower end of the standard, three other V-pulleys **22**, **24** and **26** are mounted, the first of which is carried idly in bearings associated with the brace **16**, and the second of which is mounted in the side bearing plate **18**, where it is engaged by a reduction gear drive **28** of a motor **30**, and the last of which is mounted for idle rotation at the upper end of the side bearing plate shown.

Interposed between the V-pulleys **24** and **26** there is a flat pulley **32**, which is adapted to engage the flat outer surface of a V-belt for purposes later to appear. The V-belt **36** is mounted between the V-pulleys **20—26**, inclusive, and effects a reverse bend around the flat pulley **32** between the V-pulleys **24** and **26**, as shown in Figures 1 and 2.

A flexible sheet magazine **40**, constructed in accordance with the copending application identified above, has a plurality of dependent sheets **42** mounted thereon. At their bottom edges, the sheets are provided with magnetic reinforcements **44**, which hang in relation to a holding strut **46** that passes transversely across the frame so that as the drum **40** revolves one step at a time by the weight of one sheet passing over the crown of the drum to the other side, the edge of the sheet next adjacent the strut and bearing thereagainst is lifted clear of the latter, so that it swings forwardly to the position **48** indicated in broken lines in Figure 1.

This movement of the lower edge of the free swinging sheet represents an arcuate path **50** in relation to which the magnets carried by the belt move through a tangent arc **52** around the flat pulley **32** in a manner about to be described.

The belt **36** is a V-belt, in order to run between its centers in straight flights and to afford the maximum rigidity or stiffness for the mounting of the magnets. One or more magnet supporting arms **54** are mounted in the belt, as shown in Figure 3, so as to project perpendicularly therefrom to some position adjacent the center of the sheets to be turned. As shown in Figures 4 and 5, the end of the arm **54** is provided with a journal portion **56**, on which a permanent magnet **58** of cylindrical form is carried in free revolving relation to the journal. This magnet is preferably one of those of considerable strength and retentivity which are known to the trade as "Alnico."

The inner end of the magnet carrying arm **54** is disposed to clear the flanges of the pulleys as shown in

Figure 3, and the magnet at the outer end thereof moves through a path corresponding to the flight of the belt between the V-shaped pulleys, and around the flat pulley 32 in a reverse bend, which affords the arc of travel 52 that is tangent, or substantially so, to the arc of movement 50 of the bottom of the sheet next to be turned, as described above.

The magnet 58 engages the magnetic strip 44 on the bottom of the sheet and carries it along a projection of its normal path of swing outwardly to a position somewhat to the right of the organization, as viewed in Figure 1, and thence around the pulley 26 and upwardly toward the pulleys 20 and finally downwardly between the latter and the bottom pulley 22 to the point 60, where the magnet is rolled free of the strip after exerting a firm, and yet readily releasable, downward tug on the sheet. The sheet thus turned is presented to view at the left side of the construction shown in Figure 1.

The magazine drum 40 is mounted by a shaft 62 in a slotted journal 64 in the side frames, into which it reposes by gravity for ready interchangeability. A ratchet wheel 66, having as many teeth and notches as the drum has sheets, is carried upon an end of the drum in fixed relation thereto, and is engaged by the double pawl arm 68 of an escapement mechanism, which is pivoted to the side frame at 70, and which has an upwardly extending actuating arm 72 that is disposed in the path of the magnet arms 54 in their travel on the belt 36. A leaf-spring 74 is engaged in a slot in the end of the arbor by which the escapement pawls are journaled to the side frame 12 which biases the latter to keep the arm 72 normally deflected in a clockwise direction as viewed in Figure 1, and thus normally to engage the right hand pawl of the escapement with the ratchet wheel.

The pull of the magnet in becoming released from a sheet at the position 60, and the shift of weight occasioned by the delivery of the sheet from the right hand side to the left hand side of the drum, as shown in Figure 1, are prevented from causing the drum to turn due to the engagement of the right hand pawl of the escapement mechanism with the ratchet wheel thereof until the arm 72 of the escapement is tripped by the next magnet arm to pass thereby.

When this happens, the arm is lifted and the pawls are oscillated in a counterclockwise direction as viewed in Figure 1, and are momentarily returned to the first position by the bias of the spring 74. Through this complete oscillatory cycle of the escapement mechanism, the drum is permitted to turn to the extent of one tooth of the ratchet wheel, which corresponds to the displacement of one sheet around the drum. This distance is sufficient to lift the lower edge of the next sheet to be turned clear of the strut 46 so as to permit the sheet to swing forwardly into the position 48 for engagement with the next magnet to pass thereby during the normal course of movement of the belt.

From the foregoing, it will be seen that the turning means here employed are positive in nature, in that the magnets retain hold of the sheets from the point of engagement to the point of discharge of the latter, as distinguished from the frictional means shown in the copending applications above identified, or the positive hook means which retains the sheet only until the crown of the drum has been passed by the center of gravity of the sheet being turned, which thereafter falls of its own weight into the ultimate turned position. The fastening of the magnet as a roller upon the end of the arm permits the engagement of the sheet and allows it to be turned to the final position without doubling or twisting the paper or other fabric being turned, since the shift is compensated for by the magnet's turning around the arbor 56 at the end of the carrying arm 54. Irrespective of how strong may be the magnetic coupling between the magnets and the sheets, the magnets at the discharge point 60 are stripped from the sheets by roller action in a straight-line pull so that the sheets are tugged tautly into position and are released without tearing or damaging the display material.

We claim:

1. In a flexible sheet exhibitor, the combination of a rotary magazine of flexible sheets to be turned, a hold-down device engaging the lower edges of successive sheets, said sheets approaching said hold-down device in stepped relation and being freed therefrom one at a time incident to the turning of the latter consequent thereupon, said sheets swinging clear of said hold-down device in a substantially arcuate path, and a magnetic pick-up adapted to move through a path lying essentially tangent to said arcuate path, means responsive to said magnetic pick-up carried upon the lower edges of said sheets, said magnetic pick-up comprising a magnet free to turn with respect to its mounting means so as to accommodate itself to the changing position of a sheet in engagement therewith being turned without doubling or twisting the sheet upon itself, and so as to effect a roll-off release of the sheet at the fully turned position.

2. In a flexible sheet exhibitor, a leaf turning mechanism comprising a base, a pair of side frames erected on said base, one of said side frames having upper and lower belt guides mounted thereon to mount an endless belt in a vertical essentially rectangular loop, an endless belt mounted in said guides, a cylindrical magazine of leaves to be turned journaled between said side frames within the area defined by said belt but out of contact therewith, power means in driving relation to one of said guides for driving said belt, means for effecting a magnetic couple between said belt and said leaves successively to turn the latter from one side of said magazine to the other side thereof, said lower guides having means for deflecting said belt in a reverse curve into a line with the bottom edge of one of the leaves dependent from said magazine, said magnetic couple means comprising an arm mounted on the belt in normal relation thereto and extending in substantially parallel relation to the plane of the leaves of said magazine, a magnet carried on said arm in overlying relation to said leaves, a magnetically responsive element affixed to the bottom edge of each of said leaves, and means for revolubly mounting said magnet on said arm to turn on an axis substantially coincident with the longitudinal axis of said arm.

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