United States Patent [19]

Hart et al.

[11] **3,752,468**

[45] **Aug. 14, 1973**

[54] **APPARATUS TO FACILITATE INSERTION OF NEWSPAPER SUPPLEMENTS**

[75] Inventors: **Charles H. Hart**, Nazareth, Pa.; **George R. Cashau**, Philipsburg, N.J.

[73] Assignee: **Anpa**, Easton, Pa.

[22] Filed: **Oct. 26, 1971**

[21] Appl. No.: **192,094**

Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 84,329, Oct. 27, 1970, Pat. No. 3,711,084.

[52] **U.S. Cl.** **270/57**, 198/133, 270/53

[51] **Int. Cl.** **B65h 5/30**

[58] **Field of Search** 270/53–55, 57; 112/21; 271/45, 75; 198/133

[56] **References Cited**

UNITED STATES PATENTS

3,638,936	2/1972	Hart et al.	270/57
1,793,953	2/1931	D'Humy et al.	271/75 X
845,836	3/1907	Wines	270/55

FOREIGN PATENTS OR APPLICATIONS

358,444	1/1962	Switzerland	270/57

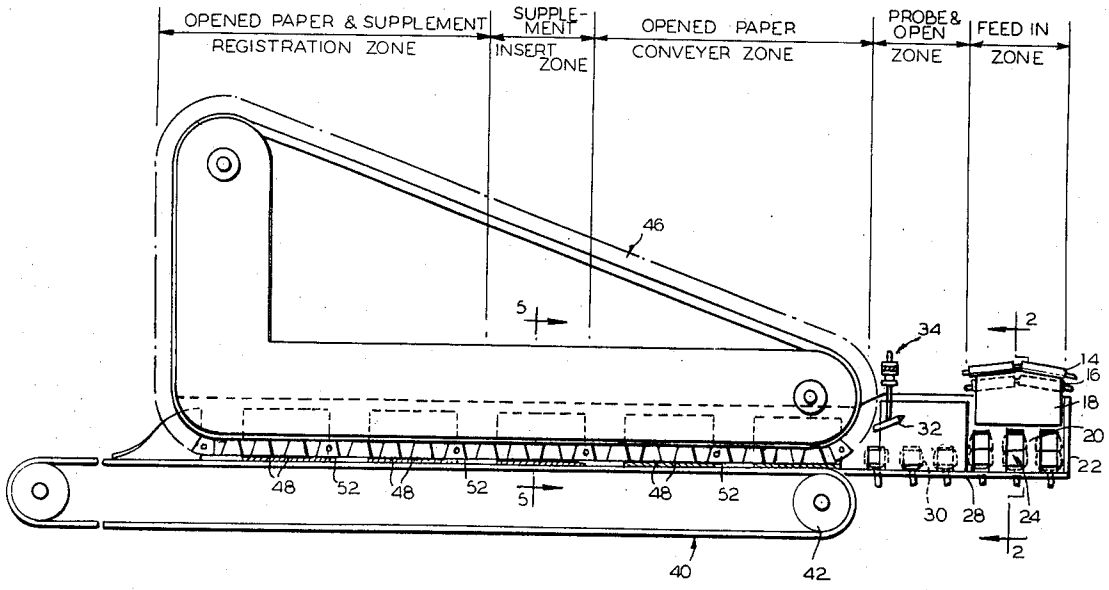
Primary Examiner—Robert W. Michell
Assistant Examiner—L. R. Oremland
Attorney—David H. Semmes

[57] **ABSTRACT**

Apparatus to facilitate insertion of newspaper supplements including means for separating a bundle of sheets comprising a folded newspaper. Means are included for feeding in folded newspapers, advancing the newspaper vertically along a lineal plane with baffle means supporting the newspaper; a plurality of drive rollers extending through the baffle on either side of the conveyer, so as to engage the folded sides of the newspaper and urge the newspaper downwardly and forwardly along a conveyor support; a pointed probe longitudinally aligned along the path of travel of the newspaper so as to engage the leading edge thereof at the top and separate the sheets laterally as they are advanced; a travelling conveyer for conveying the opened newspaper into and through a supplement insertion zone including a holddown and registry mechanism for the opened newspaper and supplement, and subsequent discharge. Means are also provided to minimize possible smearing of ink as the newspaper travels through the various zones.

The apparatus is particularly adapted to separating a printed newspaper prior to stuffing with inserts such as a TV Guide, Classified Advertising, Book Review supplements, and the like.

12 Claims, 6 Drawing Figures



PATENTED AUG 14 1973

3,752,468

SHEET 1 OF 3

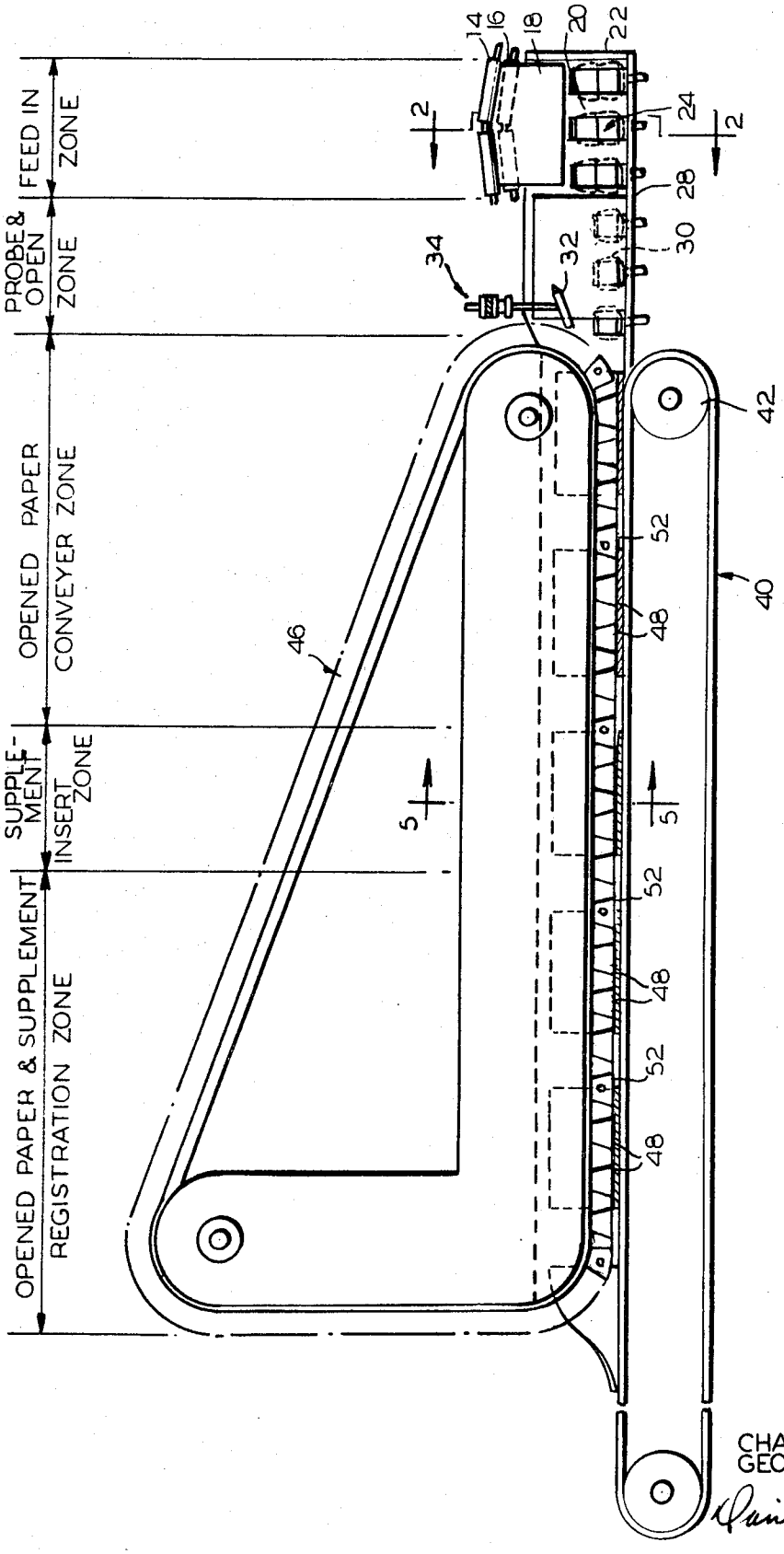


FIG. 1.

INVENTORS
CHARLES H. HART
GEORGE R. CASHAU

David H. Semmes
ATTORNEY

Fig 2.

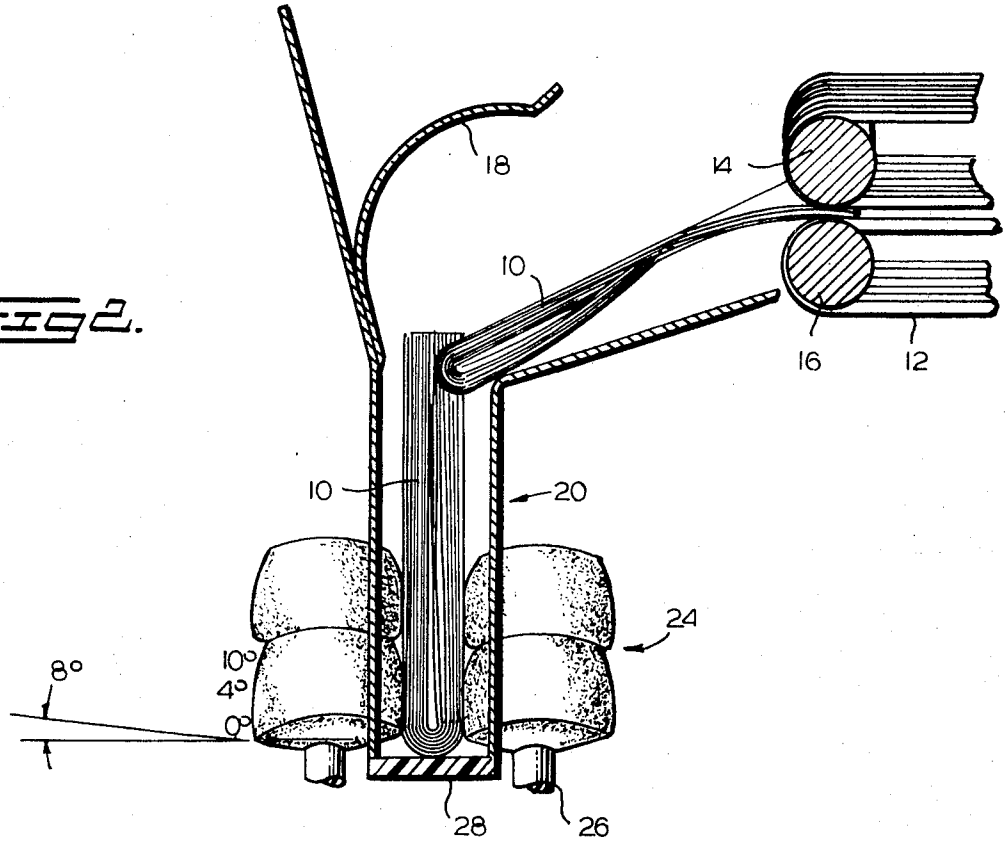
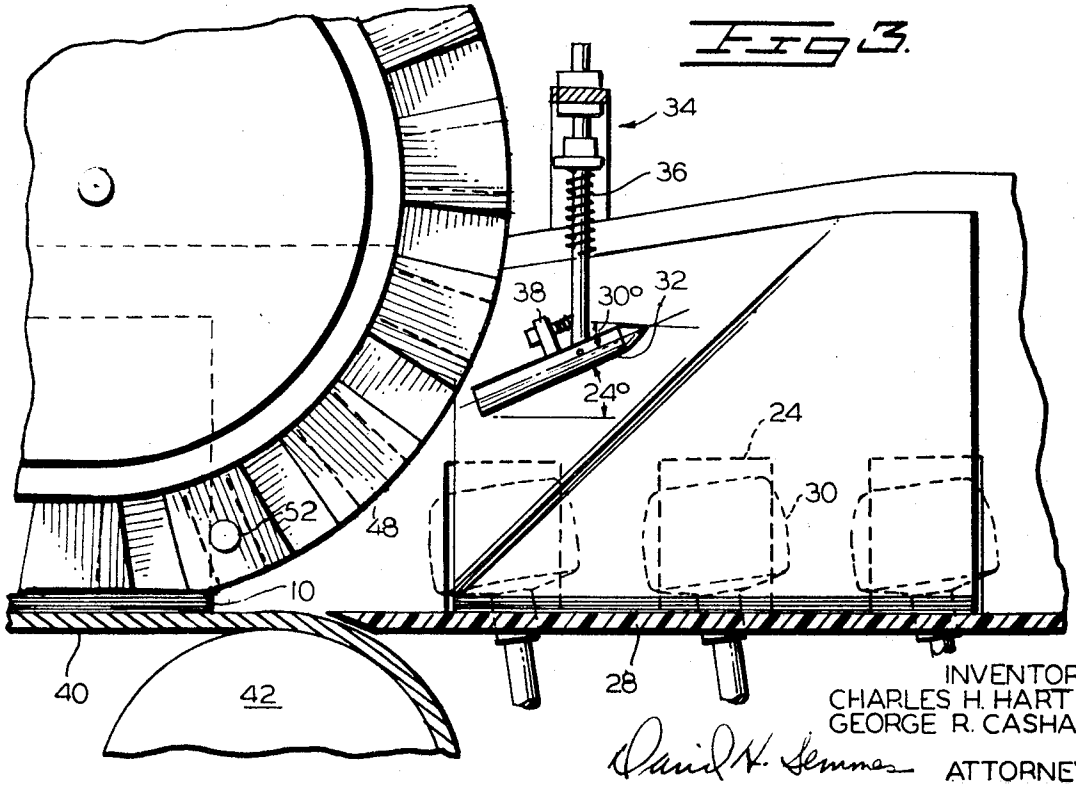


Fig 3.



INVENTORS
CHARLES H. HART
GEORGE R. CASHAU

David N. Lemmes ATTORNEY

Fig 4.

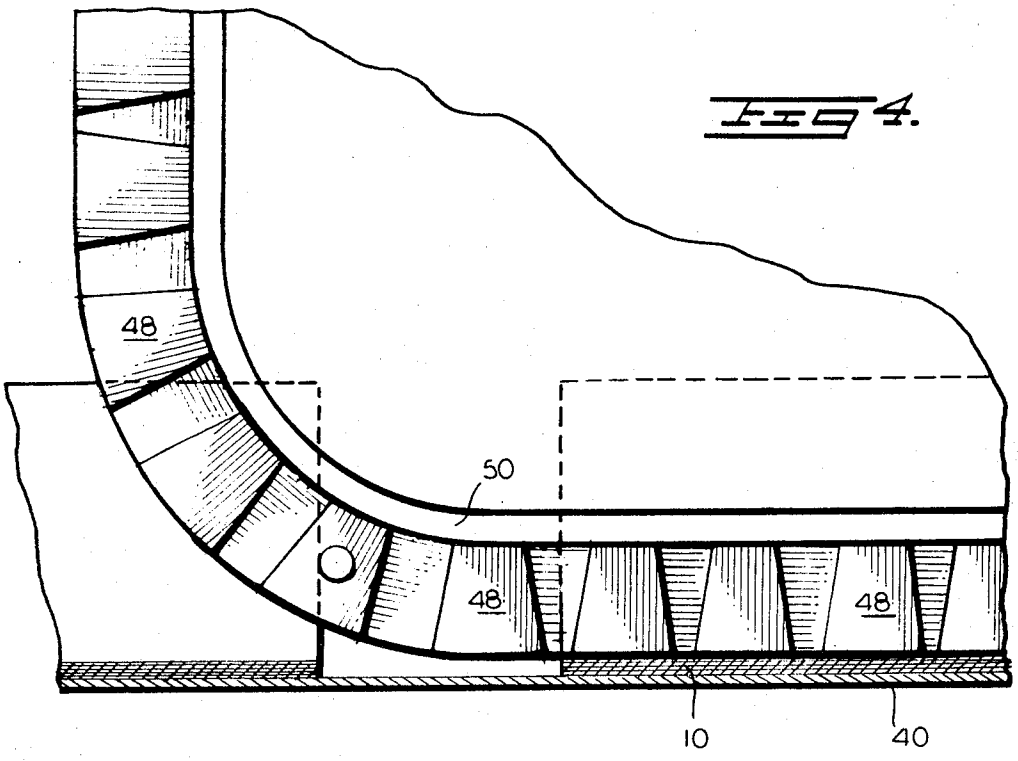


Fig 5.

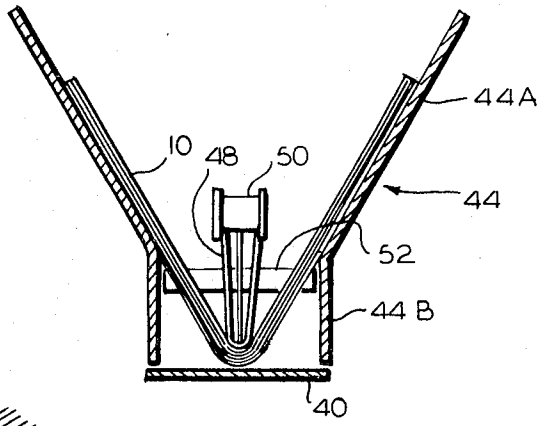
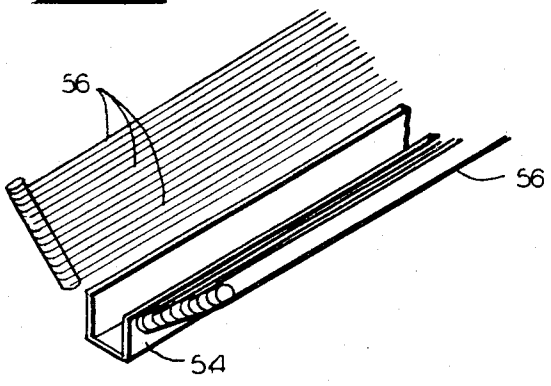


Fig 6.



INVENTORS
CHARLES H. HART
GEORGE R. CASHAU

David H. Semmes
ATTORNEY

APPARATUS TO FACILITATE INSERTION OF NEWSPAPER SUPPLEMENTS

CROSS REFERENCES TO RELATED APPLICATIONS

A continuation-in-part of applicant's Apparatus for Separating a Bundle of Plural Sheets, Ser. No. 84,329, filed Oct. 27, 1970 now U.S. Pat. No. 3,711,084.

BACKGROUND OF THE INVENTION

1. Field of the Invention

In the newspaper industry, increased attention is being given to methods for stuffing printed newspapers with inserts, such as Classified Advertising, TV Guides, or other feature supplements. Conventionally one to four inserts may accompany the daily and sunday editions. The recent increase in Post Office bulk mailing rates has contributed to the popularity of advertising in newspapers by inserts.

In the near future, printed newspapers will be delivered at belt speeds of 70,000 newspapers per hour. Thus, devices for separation and the stuffing of the newspaper are required to be accomplished at this speed in order to stay abreast of innovations in the newspaper printing industry. Conventionally, separating is done on a rotary rack, the sides of the paper being split by a reciprocating pawl, or by vacuuming, and the stuffing is induced vertically from above.

2. Description of the Prior Art

Fowler and Henkle	408,095
Curry and Linn	881,305
Nelson	1,616,061
Hathaway	1,845,412
Livingston, et al.	1,883,307
Snyder	3,052,463

These references disclose separating the newspapers with mechanical spreaders and vacuum techniques.

Note especially Fowler who teaches the use of spreader rollers 28 (column 3, lines 115–134 and column 4, lines 1–35) as well as a bottom spine 33 to separate the folds.

Curry uses a shaped guide, as well as lateral vacuum conduits for opening his top edges (see FIG. 3).

Nelson (column 2, line 25) uses rollers, V-trough and opener 17.

Hathaway (FIGS. 38 and 40; page 7, lines 81–89) uses a horizontal probe 163.

Livingston uses a horizontal conveyor belt and a V-shaped opener.

Snyder uses a stationary horizontal plane 15, the newspaper being advanced in a horizontal plane.

Our prior application as above-identified, and of which the present application is a continuation-in-part, discloses apparatus constituting an improvement and innovations over such known prior art and constitutes a substantial advance to the newspaper industry. The present invention relates to improvements and additions over and above our prior apparatus.

SUMMARY OF THE INVENTION

According to the present invention, the folded newspaper is fed into separating and supplement inserting zones by means of feed-in rolls coacting with a deflecting baffle. The so fed newspaper is rotatably grabbed on opposite sides adjacent the bottom by a plurality of rollers, and moved into sliding contact with a plate strip, such as teflon, that allows the paper to slide along until it is contacted with an opener in the nature of an upwardly tilted pointed probe, in proximity to the upper open side of the newspaper, which serves to initially open the bundle constituting the newspaper.

Subsequently, the so opened newspaper is conveyed by means of a moving conveyor belt coating with a holddown mechanism which also aids as a positive drive mechanism to the opened paper. A guideway is provided to support the newspaper in its open position, or rotating wire bands synchronized with the holddown mechanism may be substituted to carry the paper and prevent ink smearing.

Additional objects and advantages of the invention will be apparent from the following detailed description of embodiments thereof, when taken together with the accompanying drawings in which:

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a schematic longitudinal sectional view of the invention showing a folded newspaper feeder, conveyor rollers, opening probe and conveyors for transporting partially opened newspaper through a supplement inserting zone;

FIG. 2 is a vertical sectional view taken on line 22 of FIG. 1 through newspaper feeder rolls and conveyor rollers of the invention;

FIG. 3 is an enlarged fragmentary sectional view showing in greater detail the initial newspaper opening and conveying rollers;

FIG. 4 is an enlarged fragmentary view of a portion of FIG. 1 showing conveying and holddown means for the opened newspaper through a supplement inserting zone;

FIG. 5 is a vertical sectional view taken on line 55 of FIG. 1 showing in greater detail the opened newspaper conveying and holddown means; and

FIG. 6 is a fragmentary perspective view of a modified form of supporting trough and conveying means to prevent smearing of newsprint.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

In our copending application above-identified, the method of separating a newspaper is schematically illustrated. Referring to FIG. 1 the apparatus includes in operating sequence for continuous operation, a feed-in zone; a probe and opening zone; an opened paper conveyor zone; a supplement insert zone; and an opened paper and supplement registration zone. These zones are appropriately indicated on FIG. 1. As shown in FIGS. 1 and 2 a folded newspaper 10 is fed into the apparatus in the feed-in zone and as is usual the feed-in mechanism includes a plurality of endless members in the nature of resilient springs 12 in a longitudinally spread parallel array, which are appropriately driven and which convey the newspapers into the present apparatus. The folded newspaper with its folded edge leading are fed over upper and lower sets of feed rolls 14 and 16, with the rollers in the sets being angled in an upward direction which permits the paper to enter a feeder plate 18 of appropriate curvilinear configuration with proper, and necessary curvature. The feeder plate 18 feeds the folded newspaper into a trough generally designated 20.

Trough 20 is in the nature of an elongated guide channel. Double stacked rollers 22 which are appropriately driven, and being of a design and construction for

engaging and grabbing the folded newspaper in a manner to force it downwardly and forwardly, operatively extend partially through side openings **24** in the trough **20.**

As described in greater detail in our copending application the rollers shown at **22** may be identically constructed, for example, to have a bevel of 10°, 4°, and 0° on their sides, while being mounted upon shafts **26** which are appropriately driven. These rollers pull the newspaper downwardly in trough **20** while at the same time urging it forwardly and into sliding contact with a fixed teflon slider strip or plate **28.** The double stacked rollers are utilized in order to obtain earlier contact with the paper fed in this section. As the paper is advanced into the probe and open zone similar rollers **30** move the paper in the trough along the slider strip **28.** The leading edge of the newspaper is contacted by probe **32** which is pointed and disposed at an upward angle as shown. The mounting for the probe, which is adjustable, is generally indicated at **34** which permits vertical and angular adjustment thereof. The probe is spring pressed by means of spring **36.** The probe also is angularly adjustable by means of a bolt or the like shown at **38.** The probe preferably is constructed of teflon, or the like, with a pointed end and pivotably supported uon the shaft. The compression spring and adjustment mechanism permits varying pressure in a lateral direction upon the probe.

In a preferred embodiment the probe or separator device consists of a 7 inch length of teflon rod having a 30° angle at its tip to initially penetrate the closed newspaper and start to open it. The rod itself continues to open the paper and is kept at an angle of 24°. The penetration angle is reasonably critical since too small an angle would tend to tear the paper, and taper over too long a physical distance to open it quickly. Too large an angle will buckle the paper. The rod angle to the base is preferably 24°. However, it is adjustable and an angle between 15°–35° appears satisfactory.

The so initially opened paper is then passed into the open paper conveyor zone where the bottom folded edge of the newspaper is contacted by a movable belt conveyor **40** of any desired construction, such as a flexible belt appropriately mounted on driven rollers **42.** The newspaper is conveyed by the belt **40** along and through a an elongated guideway **44** having upper inclined sides **44A** and lower vertical sides **44B,** the guideway being open at the bottom to permit the newspaper to contact conveyor **40,** and as seen from FIG. **5** the sides of the opened paper are supported by the sides **44A.** The paper is thus supported in its open position during passage through this conveyor zone and subsequent zones.

A paper holddown mechanism generally designated **46** is operatively associated with guideway **44** and conveyor **40.** This holddown mechanism consists of a series of metal plates **48** attached to a metal belt drive **50.** This construction permits flexing around corners as shown. Spaced along the belt are a plurality of laterally extending arms **52** which protrude from each side of selected plates. In a preferred embodiment the arms are spaced approximately 24 inches and have a length of approximately 3 inches. These arms help as a positive drive mechanism to the open paper. The holddown plates actually hold the open paper against the moving belt at the base.

Conveyor **40** and holddown mechanism **46** are driven in synchronization and carry the paper through guideway **44** from the open paper conveyor zone into the supplement insert zone where the supplements can be inserted by any known mechanism. Following insertion the open paper and supplement are carried through a registration zone which is facilitated by means of the arms which serve as pusher and registering lugs.

In FIG. **5** a guideway **44** is shown and constitutes a workable embodiment. As the paper slides in this guideway however some ink may be smeared. In order to alleviate this situation a modified embodiment is shown in FIG. **6** which includes open upper end trough **54** for reception of the folded edge of the newspaper and positioned thereabove a plurality of rotating wire bands **56** running in synchronization with the holddown mechanism to carry the paper rather than just support it. Such a construction will substantially eliminate ink smearing.

The paper with the supplement inserted is then removed from the apparatus as shown for further disposition.

While preferred embodiments have been shown and described, obviously minor changes in details of construction can be effected without departing from the spirit and scope of the invention as defined in and limited solely by the appended claims.

We claim:

1. Apparatus to facilitate insertion of newspaper supplements comprising:

A. an extended trough;

B. feed means for introducing folded newspapers into said trough with the folded bottom edge down;

C. means slidably supporting said newspapers in said trough;

D. drive means for sliding said newspapers through said trough;

E. a newspaper opener in the line of travel of said newspapers engageable between newspaper pages in proximity the upper free edges thereof;

F. an elongated guideway extending beyond said trough and having a portion thereof extending through a supplement inserting zone;

G. a moving belt conveyor below said guideway for conveying opened newspapers into and through the supplement inserting zone; and

H. moving newspaper holddown means extending downwardly into travelling engagement with the interior of opened newspapers and in synchronized speed with said belt to maintain newspapers open through the supplement inserting zone and in operable engagement with the moving belt.

2. Apparatus as claimed in claim **1,** wherein said holddown means comprises a flexible drive member and a plurality of plate members attached thereto to permit flexing around corners, said plate members being engageable with the newspaper interior to effect holddown and contribute to movement thereof by said belt.

3. Apparatus as claimed in claim **2,** including a plurality of arms attached to and extending from opposite sides of said drive member in spaced positions therealong to permit newspapers to fit therebetween for positive moving thereof and registration of inserted supplements.

4. Apparatus as claimed in claim **3,** wherein said guideway has an open bottom and angled sides for sup-

porting opened newspapers through the supplement inserting zone.

5. Apparatus as claimed in claim **4,** wherein the sides of said guideway comprise a plurality of flexible bands driven in synchronism with said holddown means to carry open newspapers and prevent ink smearing through contact with the surfaces of said guideway.

6. Apparatus as claimed in claim **1,** said extended trough including open angled upper side portions, and vertical lower side portions terminating in an open bottom, the supporting means comprising a plate of low friction coefficient material positioned below said open bottom.

7. Apparatus as claimed in claim **6,** wherein the plate consists of Teflon.

8. Apparatus as claimed in claim **1,** said extended trough including open angled upper side portions and vertical lower side portions terminating in an open bottom, said supporting means being below said open bottom, said feed means including juxtaposed upper and lower sets of rollers, each set including at least two transversely spaced rollers upwardly angled toward the center with respect to one another to impart a central upward curvature to newspapers being fed.

9. Apparatus as claimed in claim **8,** said feed means including a plurality of endless flexible bands entrained over said sets of rollers and conjointly feeding newspapers therebetween.

10. Apparatus as claimed in claim **9,** including a curvilinear feeder plate positioned above said trough, in proximity to the discharge position of said feed means, for positive feed of fed newspapers into said trough.

11. Apparatus as claimed in claim **1,** including a plurality of pairs of driven rollers engageable with opposite sides of a newspaper inserted in said trough operable to downwardly draw said newspaper into contact with the supporting means and impelling the newspaper therealong.

12. Apparatus as claimed in claim **11,** said pairs of rollers including, at the entrance end of the trough, vertically superposed plural rollers to facilitate drawing of fed newspapers downwardly into said trough.

* * * * *