April 2, 1968 J. L. POWELL, JR., ETAL 3,375,635

NEWSPAPER EJECTING MACHINE

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Fig. 1

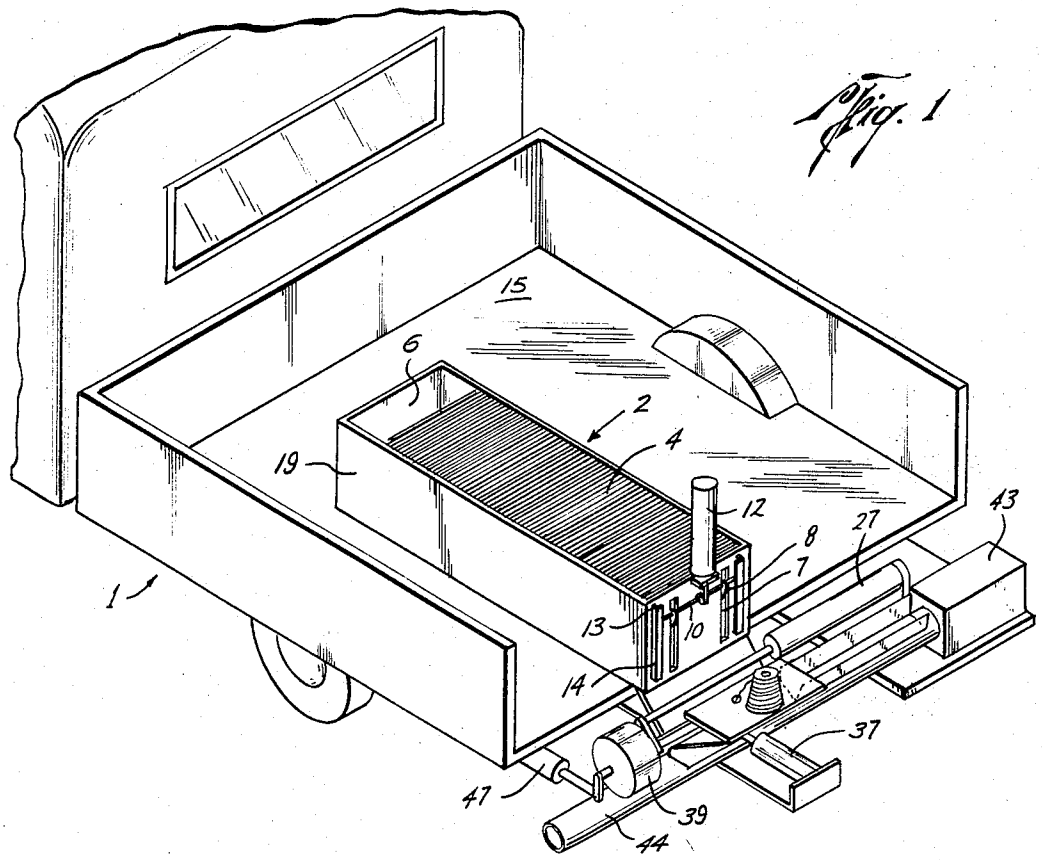
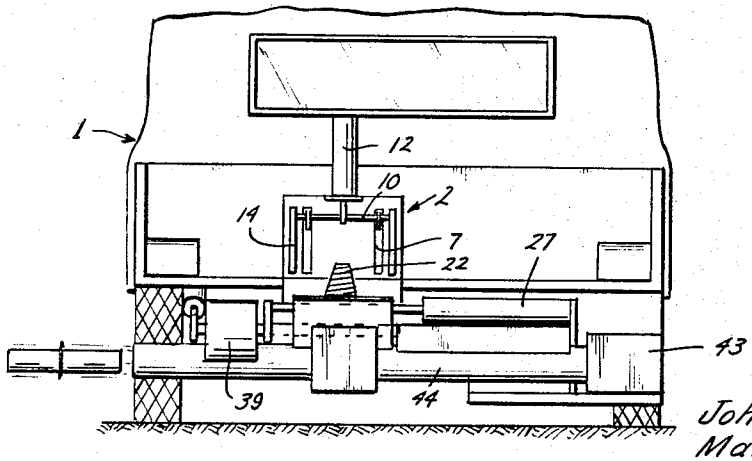


Fig. 2



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Fig. 3

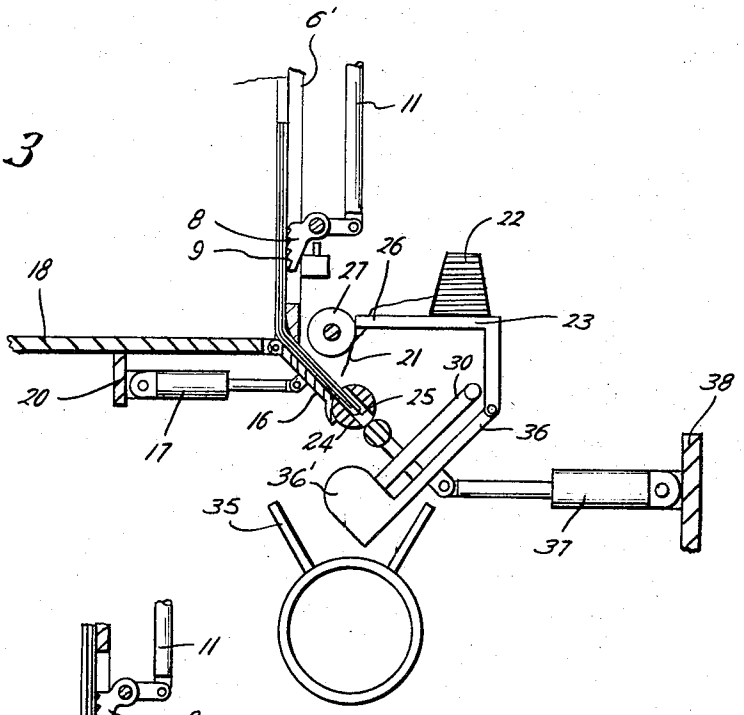
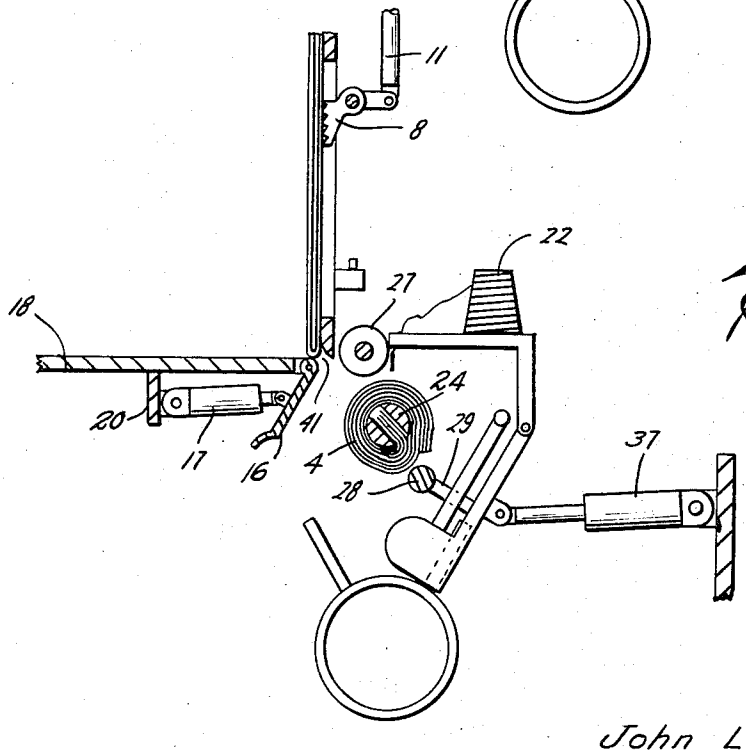


Fig. 4



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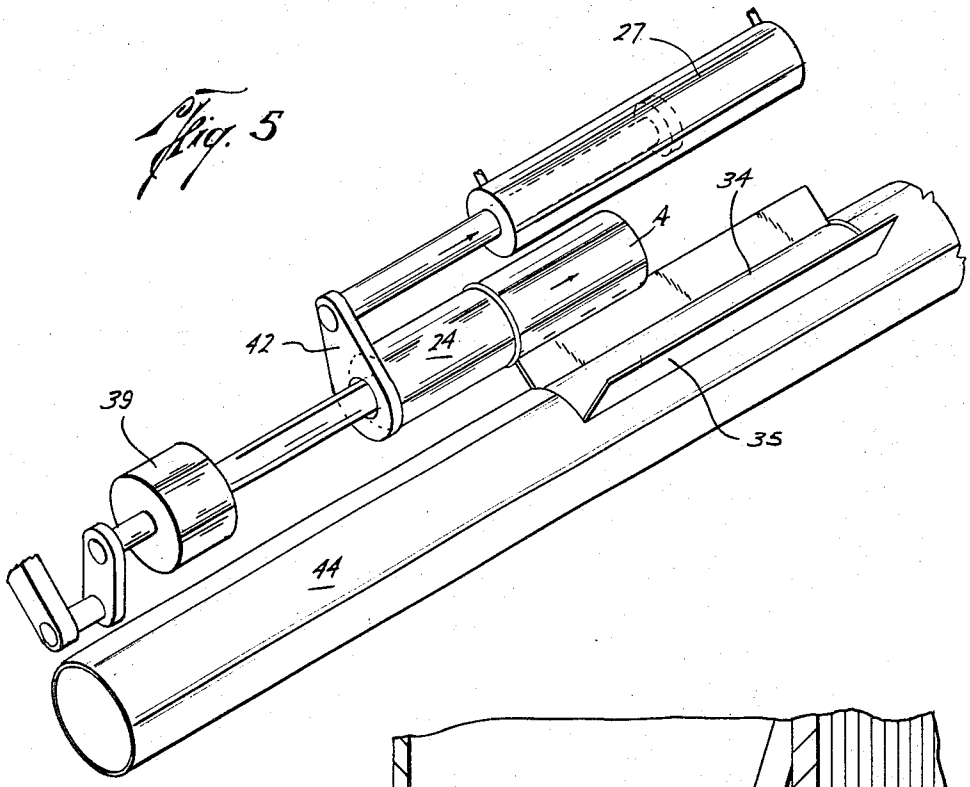
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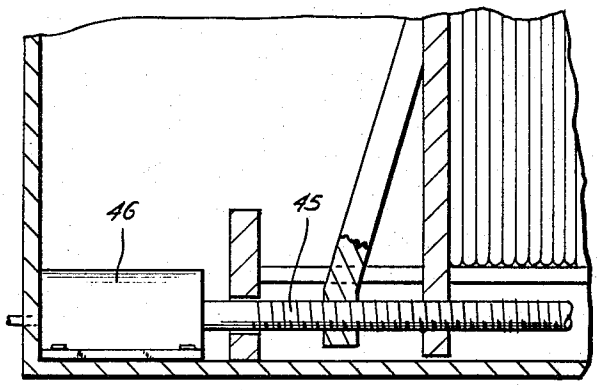
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NEWSPAPER EJECTING MACHINE

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Of Fig. 5





Of Fig. 6

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3,375,635

NEWSPAPER EJECTING MACHINE

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12 Claims. (Cl. 53—119)

ABSTRACT OF THE DISCLOSURE

Apparatus is provided for automatically delivering newspapers to the homes of subscribers. A stack of newspapers is loaded into a portable hopper, and the hopper installed on a motor vehicle. The hopper has a slot in one end, and a device for moving the newspapers toward the slot. A grappler moves the papers through the slot one-by-one, and the newspaper upon passing through the slot is wrapped upon a roller. A yoke then removes the paper from the roller, and into the barrel of an air gun. The gun is actuated to eject the newspaper into the yard of the subscriber.

This invention relates to a machine for automatically wrapping and throwing articles such as newspapers. More particularly, it relates to a machine which will automatically wrap and tie newspapers, magazines, mail, or similar objects, and thence eject them at the homes of the subscriber.

It will be readily apparent that many millions of dollars are spent each year in paying deliverers of newspapers and similar items. It is also understood that in most cases this delivery is slow and relatively inefficient in comparison with the modern methods of the present age. While others may have sought to build a machine which would replace for the most part these inefficiencies of the past, such a machine has never been successfully devised or operated.

Accordingly this invention seeks to provide a modern machine which will make delivery of newspapers and similar articles a speedy, economical, and efficient process. Further, this invention seeks to provide a machine which will wrap newspapers or similar articles and tie them securely. Furthermore, this invention provides for such objectives to be accomplished by means of a portable apparatus.

In accordance with the above and other objectives of this invention, one preferred embodiment of this invention is herein illustrated in the accompanying drawings which form a part of this specification and wherein:

FIGURE 1 is a perspective view of a machine constructed in accordance with one embodiment of this invention, mounted on the bed of a vehicle.

FIGURE 2 is a rear view of the apparatus illustrated in FIGURE 1.

FIGURE 3 is a side view of the front portion of the apparatus shown in the embodiment of FIGURE 1, at one stage of the process described herein.

FIGURE 4 is a view similar to FIGURE 3, at a later stage of the process described herein.

FIGURE 5 is an enlarged perspective view illustrating one portion of the apparatus shown in FIGURE 1.

FIGURE 6 is a side view of the rear portion of the apparatus shown in FIGURE 1.

Referring more particularly now to FIGURE 1, there is illustrated a vehicle such as truck **1** including a bed **15** having thereon apparatus **2** constructed in accordance with one embodiment of this invention.

Apparatus **2** includes a hopper **3** which is desirably constructed of a size such that newspapers **4** or the like are adapted to fit upright therein. Hopper **3** is comprised of side walls **19**, end walls **6** and **6'**, bottom **18**, and desirably includes a top (not shown) in order to protect the

newspapers from the elements. The hopper is desirably portable so that it can be taken into the press room and loaded there, and thence returned to a vehicle on which it is mounted as is shown, for example, in FIGURE 1. Although the accompanying drawings illustrate the hopper on the bed of a pick-up truck, it is of course recognized that other types of vehiclese may work equally well. And it may be desirable to elevate the hopper from the bed of the truck so that the newspapers will have a better trajectory upon ejection from the apparatus. Means are included to automatically move the newspapers to one end of the hopper where they are wrapped and ejected. Such means may take the form of pneumatic screwdriver **45** driven by a motor **46**, as illustrated in FIGURE 6.

At one end of the hopper are included means for removing the newspapers, one at a time, therefrom. As shown in FIGURES 1 and 3, such means have been found to advantageously embody elongated slots **7** in end member **6'**, through which slots the newspaper at the end of the hopper **3** may be engaged by grapplers **8**. Grapplers **8**, which may desirably include teeth **9**, may be mounted on a cross-member **10** which is free for longitudinal movement in grooves **13** of channel members **14**. Cross member **10** may be actuated for longitudinal movement by vertical arm **11** which is operated by a cylinder **12**. While any conventional unit might be employed as cylinder **12**, one particular example that has proved advantageous is Bimba Manufacturing Company air cyclinder model No. 040–LS. Such cylinders may be actuated by conventional solenoid valves.

At the juncture of end wall **6'** and bottom **18** of hopper **3** is a slot **41** through which a newspaper or the like may pass. Hingedly connected to the end of bottom wall **18** adjacent slot **41** is a flap **16** which may be constructed, for example, of rubber or metal. Flap **16** is adjustable so that slot **41** is of such a size that only one newspaper will pass therethrough. Flap **16** is moved back and forth by means such as an air cylinder **17**, which is advantageously actuated by a solenoid valve. Cylinder **17**, which may be similar in type to cylinder **12**, may be conveniently mounted on a brace **20** beneath the bottom plate **18** of hopper **3**.

Positioned beneath slot **41**, and adapted to be in engagement with flap **16** when the flap is extended, are means for folding or rolling a newspaper to a size and form readily adaptable for ejection from the apparatus, such as roller **24** having an axial slot **25** therein. Slot **25** is adapted to receive a newspaper **4**, and after a newspaper has been engaged in and wrapped around the roller **24**, it is held to the roller by an idler roller **28** which is held in position against the newspaper by means such as spring **29** on member **30** and which is desirably included in order to force the newspaper to roll tight and, if wrapper is used, to secure as good a wrap as possible.

The roller **24** may conveniently be tapered toward one end thereof to facilitate removal of a paper therefrom. Also, it may be desirable to have two idler rollers **28**, one on each side of the machine. When such an arrangement is used, apparatus may be inserted between the two idler rollers to effect tying or wrapping of the newspapers.

Conveniently mounted adjacent roller **24**, may be a tying or wrapping mechanism **36** such as that illustrated in FIGURE 3. A ball **22** of string **21** may be mounted on a plate **23** above roller **24**. Through a hole **26** in plate **23** the string is passed adjacent roller **24** so that newspaper **4** thereon may be securely tied. Tying machine **36** may be actuated by cylinder **37**, such as those described above, which may be conveniently mounted on brace **38**. Of course it is understood that any appropriate tying machine may be employed, and likewise any convenient tying agent, such as string or tape, may be employed.

On rainy days it is often desirable that the papers be wrapped in order to prevent their becoming wet. Thus,

it is often desirable to include means for wrapping the newspaper, and such means may conveniently be mounted adjacent roller **24**, and are illustrated at **36'**. A roll of plastic material such as Saran, a polyvinylidene chloride material marketed by Dow Chemical Company, has been found to be particularly advantageous when mounted at **36**. Any conventional means may be included for separating the wrapping material into lengths appropriate for binding a single paper. It will be understood that such material will securely bind the newspaper and, if it is employed, it will not ordinarily be necessary to tie the newspaper.

Roller **24** may be actuated by means such as cylinder **47** through a reduction gear **39** (for example, a 10 to 1 reduction gear). Means such as yoke **42**, which is clearly illustrated in FIGURE 5, are adapted to sweep newspaper **4** off roller **24**; such yoke may be actuated by cylinder **27**.

Positioned beneath roller **24** is barrel **44** of gun **43**, the barrel having an opening **34** therein adapted to receive newspaper **4**. It is sometimes desired to include flexible flaps **35** on each side of opening **34** to guide newspaper **4** into said opening. Gun **43** may be any conventional ejector mechanism such as Model No. 7977 air shot gun of Aro Corporation, or Duo-Fast Model CN–135.

Each of the air cylinders is conveniently linked by an air line to a common air tank of, e.g., 100 p.s.i. pressure. As is evident to those skilled in the art, the appropriate air regulators may be placed in such lines.

In operation, it is readily seen that a stack of newspapers off the press may conveniently be loaded into the hopper **3**, and the hopper loaded on a vehicle as shown in FIGURE 1.

At the appropriate point, a switch which is conveniently located in the cab of the vehicle and which may be operated by a suitable button, is engaged, this switch activating both the solenoid valve which controls the gun **43** and also the cylinder **27**. As this switch is activated, it is readily apparent that the gun **43** fires the newspaper which is in the barrel **44**, and the yoke **42** sweeps the next newspaper off roller **24** into barrel **44**. As the yoke **42** approaches the end of roller **24**, it strikes a microswitch which is located at the end of roller **24**, this microswitch being connected to the solenoid valve operating the cylinder **12**. Grapplers **8**, engaging the newspaper in the front end of hopper **3**, move this newspaper downward through the slot **41** toward slotted roller **24**. Another microswitch which may conveniently be located near the bottom of one of the channel members **14**, is connected to activate the cylinders **17** and **47** through their respective solenoid valves. Thus, as the newspaper is moved through the slot **41** by grapplers **8**, it is met by flap **16** which guides it into slot **25** of roller **24**. Then, as the newspaper enters the slot **25**, the roller **24** is turned through reduction gear **39** and the newspaper is securely rolled thereon.

Another microswitch may be positioned so that it will be struck by the arm of reduction gear **39**, this microswitch activating the cylinder **37** which operates the tying machine or wrapper dispenser **36**. And yet another microswitch, at the end of the stroke of this arm, is connected to cylinder **47** causing this cylinder to return to its original position. The "fire" button is then engaged again and the sequence is repeated.

For example, a microswitch in the barrel **44** might indicate—through, for instance, a red warning light in the cab of vehicle **1**—when the barrel is empty.

It is contemplated that all microswitches may be wired through a common energy source, which may conveniently be the battery of the vehicle.

It is also contemplated as another feature of this invention that an automatic device may be employed in order to assure that newspapers are thrown at the homes of subscribers, and at those homes only. For instance, an electric eye type of device may be installed on the machine, and reflector devices at the homes of subscribers. The scanning device would automatically actuate the switch to throw a newspaper at the home of a subscriber as soon as it had been energized by the reflector at that home. Of course, any one of many types of scanning devices might be useful for such a purpose.

While the invention has been described in terms of one particularly useful embodiment, it will be evident to one skilled in the art that numerous changes may be made without departing from the scope of this invention, which is defined by the appended claims.

We claim:

1. Apparatus for automatically delivery newspapers to the homes of subscribers comprising in combination: a hopper for containing a plurality of newspapers to be delivered, said hopper having a slot in one end thereof for removal of the newspapers one at a time, and means for moving the newspapers toward said slot; means for removing said newspapers one at a time through said slot; a roller for receiving a newspaper through said slot; means for rotating said roller to wrap said newspaper thereon; means for removing said newspapers from said roller and into ejecting means; and means for ejecting said newspapers from said ejecting means to thereby deliver the newspaper to the desired location.

2. Apparatus for automatically delivering newspapers at the homes of subscribers comprising in combination: a portable hopper for containing a plurality of newspapers to be delivered, said hopper having a slot in one end thereof for exit of the newspapers one at a time through said slot, and means for moving the newspapers toward said slot; means for removing said newspaper one at a time through said slot; a roller for receiving a newspaper through said slot in said hopper; means for rotating said roller to wrap said newspaper thereon; means adjacent said roller for securely tying a newspaper; means for removing said newspapers from said roller and into ejecting means; and, means for ejecting said newspapers from said ejecting means to thereby deliver the newspaper to the desired location.

3. Apparatus for automatically delivering newspapers at the homes of subscribers comprising in combination: a hopper for containing the newspapers to be delivered and including in one end thereof a slot through which the newspapers may be dispensed; means for moving the newspapers in said hopper to said slot; roller means positioned adjacent said slot; means for removing said newspapers one at a time through said slot onto said roller; means for rotating said roller to wrap said newspapers thereon; means for removing said newspapers from said roller and into ejecting means; and means for ejecting said newspapers from said ejecting means to thereby deliver the newspapers to the desired location.

4. The apparatus of claim **3** wherein said means for moving the newspapers in said hopper is a pneumatic screw conveyor.

5. The apparatus as defined in claim **3** wherein said roller means comprises a generally solid cylindrical roller having a longitudinal slot therein whereby a newspaper may be positioned in said slot of said roller and thence wrapped around the periphery of said roller.

6. Apparatus as defined in claim **3** whereas said ejecting means comprises a gun portion and a barrel portion in the form of a generally hollow cylinder.

7. Apparatus as defined in claim **3** wherein said means for removing said newspapers from said roller comprises a yoke which is actuated by an air cylinder.

8. Apparatus for automatically delivering newspapers at the homes of subscribers comprising in combination: a portable hopper for containing the newspapers to be delivered and including in one end thereof a slot through which the newspapers may be dispensed; means for moving the newspapers in said hopper toward said slot; roller means positioned adjacent said slot; means for removing said newspapers one at a time through said slot onto said roller; means for rotating said roller to wrap said newspapers thereon; means for securely tying said newspapers while on said roller; means for removing said

newspapers from said roller and into ejecting means; and means for ejecting said newspapers from said ejecting means to thereby deliver the newspapers to the desired location.

9. Apparatus for delivering newspapers at preselected points comprising: means for holding a plurality of newspapers and dispensing the newspapers one by one; means operably connected with said dispensing means for folding the newspapers in a form readily adapted for delivery; and means operably connected with said folding means for delivering the newspapers at preselected points, wherein said folding means comprises a longitudinal roller having an axial slot through a portion thereof, said slot being adapted to receive the newspaper from said dispensing means.

10. Apparatus as defined in claim 1 wherein: said ejecting means comprises a gun having a barrel portion adapted to receive a folded newspaper from said roller.

11. Apparatus for delivering newspapers at preselected points comprising in combination: a portable hopper for holding a plurality of newspapers, said hopper including a slot in one end thereof through which a newspaper may be removed from said hopper, a flap adjacent said slot, said flap being adapted for forward movement to support a newspaper on its removal from said hopper, and for backward movement thereafter, and means urging said newspapers toward said slot; a roller located adjacent said flap and comprising a longitudinal roller having an axial slot through a portion thereof; means for rotating said roller to wrap a newspaper thereon; a yoke for removing the newspaper from said roller; and a gun for receiving said newspaper from said roller and throwing it at a preselected point.

12. Apparatus for delivering newspapers at preselected points comprising in combination: a portable hopper for holding a plurality of newspapers, said hopper including a sblot in one end thereof through which a newspaper may be removed from said hopper, a flap adjacent said slot, said flap being adapted for forward movement to support a newspaper on its removal from said hopper, and for backward movement theerafter, and means urging said newspapers toward said slot; a roller located adjacent said flap and comprising a longitudinal roller having an axial slot through a portion thereof; means for rotating said roller to wrap a newspaper thereon; a tying machine operably connected with said roller for securely tying the newspaper thereon; a yoke for removing the newspaper from said roller; and a gun for receiving said newspaper from said roller and throwing it at a preselected point.

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