To all whom it may concern:

Be it known that I, Harry Vincent Ball, a citizen of the United States, residing at Montreal, Province of Quebec, Dominion of Canada, have invented certain new and useful Improvements in Driving Mechanism for Web-Printing Machines, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

This invention relates to certain improvements in multiple unit printing machines, that is, machines employing a plurality of printing mechanisms printing a plurality of webs.

In such multiple unit machines, the webs from the units are usually associated and led to cutting and folding mechanisms for producing the desired products from the associated webs. It is desirable in this class of machines that if one of the webs should break, the remaining printing units in which the webs running through unbroken should be silenced to avoid waste of paper while the broken web is led up to the folder to be again associated in proper register with the unbroken webs, and it is desirable to effect this by slowly running the printing cylinders of the unit in which the web is broken so that the broken web may be fed up to the folder.

It is the object of the present invention to produce a driving mechanism for such multiple unit machines in which any of the units may be run at a slow speed and the other units silenced, so that a broken web in one of the units may again be brought up to the folder without running the other units, thus avoiding waste of paper and permitting a convenient feed of the web to the folder.

One construction for carrying out the object of the invention is shown in the accompanying drawings, in which

Figure 1 is a diagrammatic side elevation of a multiple unit printing machine;
Fig. 2 is a section on an enlarged scale, partly broken away, of the clutch and connections for operating at high and low speeds, and
Fig. 3 is a detail, partly in section, taken on line 3-3 of Fig. 2.

Referring now to these drawings, the invention has been illustrated as used with a multiple rotary printing machine in which there are three printing units, but it will be understood that the invention is capable of use with other types of printing machines, and that it may be used with printing machines having any desired number of units.

In the drawings, these units are indicated generally by the letters A, B, C. Each of these units include the usual printing and perfecting mechanisms for printing and perfecting the webs W, W', and W''.

The particular mechanism employed whereby one or more of the units may be driven to feed the web forward while the other units are silenced, may be somewhat varied in construction. In the particular construction illustrated, however, there will be provided a common driving shaft 1, which is or may be driven from any suitable source of power, as through a train of gearing 2 from a driven shaft 3 of the machine, this shaft being operated through the usual clutch connection, not illustrated, as it is unnecessary for an understanding of the invention. The shaft 1 is what may be called the high speed shaft, through which the printing mechanisms are driven at running speed through connections hereinafter referred to.

To effect the slow running of any one of the units when desired, there is provided a second shaft 4 which may be termed a low speed shaft, which is driven through a suitable train of gearing 5 from a source of power, as a small low speed motor 6. The silencing of the units necessary to silence, and the running of the unit desired for drawing the broken web through, is effected from the shafts 1 and 4, through the medium of double clutches, indicated generally by the numeral 7, one of these clutches being provided for each of the units of the machine, and operating through connections which will now be described.

While the special construction of the driving connections from the clutches may be varied, these connections will be the same for all the units, and it will be necessary to describe but one of them. Referring now to Fig. 2, and assuming that the construction therein shown is for driving unit B, the unit is driven from a vertical shaft 8 provided with miters 9, 10. The lower miter 10 meshes with a miter 11 formed on one end of an elongated sleeve 12, loose on the high power shaft 1, before referred to, this sleeve 12 taking bearing in a suitable boss, as 13.
The sleeve 12 has a reduced end 14, to which is keyed, by a key 15, a sliding clutch 16, having engaging members 17, 18 on the opposite faces thereof. High power shaft 1 has fast thereon, beyond the reduced end of the sleeve 14, a stationary clutch member 19. When the unit is at a running speed, the clutch is positioned so that the clutch engaging members 16 engage with the member 19, thus clutching the sleeve 14 onto the power shaft and driving the unit through the miter gears 11, 10, before referred to.

Now, if a web should break, as indicated at X, in the web W being printed upon by unit B, all the units are stopped by stopping the high power shaft, and the clutch which controls unit B is moved from engagement with the clutch member 19 to engagement with the clutch member 20 on the other side, which is driven from the low speed shaft 4, before referred to. The particular means for operating this may be somewhat varied, but as illustrated the clutch member 20 is a gear having engaging projections or teeth 21 formed on the face thereof, this clutch member being loosely mounted on the sleeve 12, before referred to, and meshing with a gear 22 on the low speed shaft 4. The drive for the unit when the clutch is in this position, it being remembered that the clutch is keyed to the sleeve, is through gear 22, clutch member 20, and sleeve 12, through miter gears 11 and 10, before referred to.

With this construction, the units A, C of the press may remain stationary, and the unit B may be turned over at a low speed to feed the web through until the broken web W has been properly associated with the other webs at the folder. After these have been properly associated, the clutch controlling unit B is moved to engagement with the clutch member 19 on the high speed shaft, which may then be started up from the main control of the machine, and all the units can run together and the consequent wastage of paper in units A and C is prevented.

Certain changes and variations may be made in the type of clutch shown and described, and in the driving connections, for effecting the above results, and it is understood that such changes and variations may be made without departing from the invention as defined by the claims.

What is claimed:

1. In a web printing machine, the combination with a plurality of printing units, of mechanism for driving all the units at high speed, an independent driving mechanism for driving the units at low speed common to all the units, and connections whereby any one of the units may be driven from the low speed drive, the other units being silenced.

2. In a web printing machine, the combination with a plurality of printing units, of a high speed driving shaft, from which all the units are driven, an independently operated low speed driving shaft common to all the units, and a clutch mechanism for each unit whereby any one of the units may be driven from the low speed shaft, the other units being silenced.

3. In a web printing machine, the combination with a plurality of printing units, of a high speed shaft common to all the units for driving the same, a low speed shaft and independent driving means for driving it, and a clutch mechanism for each unit to connect a unit with either the high speed or low speed shaft, whereby any one of the units may be driven from the low speed shaft, and the other units silenced.

4. In a web printing machine, the combination with a plurality of printing units, of a high speed shaft from which the units are driven, a low speed shaft, a sliding clutch for each unit, clutch members fast on the high speed shaft, clutch members loosely mounted on the high speed shaft, connections from the latter to the low speed shaft, and sliding clutches keyed to the loosely mounted members normally out of engagement with the members and movable into clutching engagement therewith.

5. In a web printing machine, the combination with a plurality of printing units, of a high speed shaft, a low speed shaft, sleeves loosely mounted on the high speed shaft, connections from the sleeves to the units, geared clutch members loosely mounted on the sleeve driven from the low speed shaft, and sliding clutches keyed to the sleeves normally out of engagement with the clutch members and movable into clutching engagement therewith.

6. In a web printing machine, the combination with a plurality of printing units each including a printing couple, of mechanism for driving all the couples at high speed, independent driving mechanism for driving each of the couples at low speed, and connections whereby any one of the couples may be driven from the low speed drive and the other couples silenced.

In testimony, whereof, I have hereunto set my hand.

HARRY VINCENT BALL.