

PAPER SHEETS FEEDING APPARATUS

Background of the invention

(1) Field of the invention

The present invention relates to a paper sheet feeding apparatus, for example, applied to a paper money input and output machine mounted in an automated teller machine (ATM) of a financial institution.

(2) Description of related art

In general, in the case that the paper sheets such as the paper money and the like are stored in an inner portion of the ATM, the input paper sheets are fed out, carried and stored into the inner portion of the ATM one by one by using a feed control mechanism provided in an input port.

In general, the paper sheets input to the input port are separated into one so as to be fed out and carried by the feed portion, for example, the separable paper moneys, however, there is a case that an abnormal medium which is not normally fed out or which is not normally carried even if it is fed out is input in some input paper sheets.

As an example of the abnormal medium, there can be listed up an absolutely different material from the paper sheets, for example, a coin, a passbook or the like, and a paper sheet having an absolutely

different shape from the normal paper sheets, for example, a banded paper sheets, a receipt, a hard damaged paper sheet and the like.

During the feed control, if the input paper
5 sheet is detected as the abnormal medium, the input paper sheet is returned to a customer.

For example, in the case of the ATM of the financial institution, if the customer inputs the abnormal medium, the abnormal medium is detected by the
10 feed control mechanism, the paper sheet is returned to the customer, a guidance urging the customer to again input after checking the paper sheet is carried out, and a deal is carried out.

As the detecting method of the abnormal
15 medium, there are disclosed various methods in accordance with a holding way of the abnormal medium.

There is disclosed a structure that in the case that a generally large abnormal medium (foreign material) is input, the abnormal medium can not pass
20 through a position through which one separated paper money passes at a time of starting the feed as shown in Fig. 3, the abnormal medium comes down together with a feed roller 14 and a gate roller 15, and is detected by a foreign material detecting sensor 16 so as to be
25 determined as the foreign material and stop an operation, so that the paper sheet is not output any more.

Further, there is a structure that in the

case that the foreign material is input, a feeding operation is stopped by determining "nonprocess runout" even if the foreign material detecting sensor 16 does not shield light, thereby preventing the paper sheet
5 from being output any more, because it takes a long time to feed out the foreign material by the present mechanism.

As a known publication, there has been proposed a mechanism of detecting the abnormal medium
10 at a time of feeding out (refer to patent document 1 (JP-A-8-194859)). This method detects a great posture change (a significantly great slant) and a deformation (a great fold-down of the paper sheet, or a greatly different state from the normal paper sheet dimension
15 due to a breakage) by a plurality of sensors arranged in a vertical direction just after feeding, and returns the abnormal paper sheet after stopping and reverse rotating a feed motor at a time of detecting the abnormality.

20 As the other known publication, there has been known a mechanism of having a detection coil built in a feed mechanism, detecting with or without a metal on the basis of a detected value of the detection coil, and returning the paper sheet without feeding out at a
25 time of detecting the metal (refer to patent document 2 (JP-B2-3199605)).

In Fig. 3, in a state in which the paper sheets can not be separated due to some kind or another

reason, for example, if the banded paper money or the like is enough large to be prevented from passing through the feed roller 14 and the gate roller 15, the paper sheets are not separated and the feeding is
5 finished.

However, in a region which is not accustomed to a money input deal overseas, a lot of people inputs a paper sheets bundle having a similar thickness to a gap between the feed roller 14 and the gate roller 15,
10 the paper sheets bundle which can not be separated by the feed mechanism, such as ten sheets of paper sheets fastened by a staple of a stapler, a clip or a rubber band. In the case mentioned above, even if the feed motor 12 is stopped at a timing when the foreign
15 material detecting sensor 16 shields light, the paper sheets bundle passes by force between the feed roller 14 and the gate roller 15 and the feed sensor 17, and is pulled by a carrier motor drive. The paper sheets bundle fastened by the staple of the stapler or the
20 rubber band is broken and scattered, and in the paper sheets bundle fastened by the clip, the clip is separated, and is mixed into the carrier path, thereby causing a breakage of the apparatus. Even if the feed motor 12 is stopped at the timing when the foreign
25 material detecting sensor 16 shields light, the stop timing is late, and the paper sheets bundle is already scattered (refer to Fig. 4).

In the case mentioned above, it is possible

to quicken the light shielding timing of the foreign material detecting sensor 16, for example, by making a spring pressure of the spring 18 weak or making a predetermined time for determining "nonprocess runout" shorter than the normal one so as to prevent the paper sheet bundle from being fed out, however, in this case, the detection works even at a time when the normally handled separable paper sheets bundle is input, and there is generated a problem that the function serving as the feed mechanism is not obtained.

Further, there is a method which requires the mechanism of detecting with or without the metal within the feed mechanism and returns the paper sheets without carrying out the feeding at a time of detecting the metal as mentioned above, however, there are problems (1) a wide cost increase is caused for carrying out the structure having the function of detecting the metal, and (2) the method is effective in the case that the paper sheets are bundled by the metal, however, can not correspond to the case that the paper sheets are bundled by a nonmetal such as the rubber band or the like.

Further, in the patent document 1, there is generated a problem that it is possible to detect the great posture change and the deformation as a result of the scattering of the paper sheets bundle, however, the timing is later for stopping the feeding so as to return the paper sheets after the paper sheets are

scattered, and it is impossible to stop the feeding by detecting the paper sheets bundle on the basis of the thickness.

Brief summary of the invention

5 An object of the present invention is to provide a paper sheets feeding apparatus structured such that the paper sheets bundle as mentioned above is detected in advance of carrying to an inner portion of the apparatus so as to prevent the paper sheets bundle
10 from being carried into the inner portion of the apparatus, by paying attention to a fact that only the paper sheets bundle frequently exists at a time when the paper sheets bundle fastened by the rubber band is input.

15 In order to achieve the object mentioned above, the present invention employs a structure in which a pressing means presses paper sheets in a thickness direction, a separating means separates and feeds the pressed paper sheets, a first detecting means
20 detects whether or not a normal feed is carried out, and a control means differently carried out a paper sheets feed control in the case that a normal feed is carried out, and a paper sheets feed control in the case that the normal feed is not carried out.

25 Specifically, in accordance with the present invention, there is provided a paper sheets feeding apparatus feeding and storing paper sheets, comprising:

a pressing means pressing paper sheets to be fed;

a separating means separating and feeding the paper sheets pressed by the pressing means;

5 a first detecting means detecting whether or not the paper sheets feed by the separating means is a normal feed; and

a control means differently control a paper sheets feed in the case that a detected result by the
10 first detecting means is not a normal feed, and a paper sheets feed in the case that the detected result is the normal feed.

In the paper sheets feeding apparatus in accordance with the present invention, it is preferable
15 that the control means controls in such a manner as to make a pressing force applied to the paper sheets by the pressing means in the paper sheets feed in the case that the detected result by the first detecting means is not the normal feed lower than a pressing force
20 applied to the paper sheets by the pressing means in the paper sheets feed in the case that the detected result is the normal feed.

Further, in the paper sheets feeding apparatus in accordance with the present invention, it
25 is preferable that the paper sheets feeding apparatus is provided with a second detecting means detecting the paper sheets fed by the separating means,

the control means measures an arrival time

necessary for the paper sheets fed by the separating means to reach the second detecting means, and

the control means controls so as to stop the feed in the case that the arrival time at a time of feeding the paper sheets is longer than a predetermined value.

Further, in the paper sheets feeding apparatus in accordance with the present invention, it is preferable that the paper sheets feeding apparatus is provided with a memory means storing an operational information relating to the feed control of the control means, and

the control means carries out the feed control in accordance with the operational information stored in the memory means.

Further, in the paper sheets feeding apparatus in accordance with the present invention, it is preferable that the paper sheets feeding apparatus is provided with a second detecting means detecting the paper sheets fed by the separating means,

the control means measures an arrival time necessary for the paper sheets fed by the separating means to reach the second detecting means,

the control means controls so as to stop the feed in the case that the arrival time at a time of feeding the paper sheets is longer than a predetermined value, and

the operational information includes an

information for setting the predetermined value smaller than a previously determined value.

Further, in the paper sheets feeding apparatus in accordance with the present invention, it is preferable that the control means controls so as to stop the feeding operation of the paper sheets by the separating means in the case that the detected result by the first detecting means is not the normal feed.

Further, in the paper sheets feeding apparatus in accordance with the present invention, it is preferable that the paper sheets feeding apparatus is provided with a second detecting means detecting the paper sheets fed by the separating means, and

the operational information stored in the memory means includes an information relating to the feed control by the control means with respect to the detection by the second detecting means.

In accordance with the present invention, it is possible to achieve an effect that the paper sheets can be smoothly fed out in correspondence to an aspect of the paper sheets to be fed.

Brief description of the several views of the drawings

Fig. 1 is a structure view of a paper money input and output machine;

Fig. 2 is a schematic view of a feed control mechanism;

Fig. 3 is an explanatory view of a feed

control at a time of detecting a foreign material;

Fig. 4 is an explanatory view of a feed control at a time of inputting a paper sheets bundle (about ten sheets);

5 Fig. 5 is a block diagram of an inner portion of a feed control mechanism;

Fig. 6 is a control flow chart at a time of starting;

Fig. 7 is a flow chart of a feed control; and

10 Fig. 8 is a guidance view.

Detailed description of the invention

A description will be given below of an embodiment in accordance with the present invention. The present embodiment relates to a paper money input and output machine mounted in an inner portion of an automatic dealing apparatus, for example, an automated teller machine (ATM) of a financial institution or the like.

Fig. 1 is a view showing an internal structure of a paper money input and output machine from a side surface. As shown in Fig. 1, the paper money input and output machine is constituted by a money input and output port 1, an identification portion 2, a temporary reservation portion 3, a return reservation portion 4, a reject box 5, cassettes A to D (6 to 9), and a carrier path 10 carrying a paper money therebetween.

Further, a paper money control for money input and output deal is as follows.

At a time of the money input deal, the paper money input and output machine carries the paper money input to the money input and output port 1 to the identification portion 2 arranged at an upper medium position, identifies truth, money kind, number, breakage, dirty and the like of the paper money, and thereafter carries to the temporary reservation portion 3 so as to temporarily reserve. The paper money determined to be defective in identification at a time of dealing is temporarily reserved in the return reservation portion 4 and is later returned to the money input and output port 1.

The temporary reservation portion 3 temporarily reserves the input paper money here every money input deal, carries the temporarily reserved paper money to the identification portion 2 after settlement of money input, identifies the money kind, the number, the breakage, the dirt and the like of the paper sheets, and thereafter distributes and stores in the cassettes A to D in the lower sides 6 to 9. The paper money determined to be defective in identification at this time is stored in the reject box 5.

On the other hand, at a time of the money output deal, the output paper money fed out from the cassettes A to D in the sections 6 to 9 is discharged

to the money input and output port 1 after checking the money kind, the number, the breakage, the dirt and the like by the identification portion 2. The paper money determined to be defective in identification at this
5 time is stored in the reject box 5.

In the present embodiment, the paper sheets feeding apparatus is mounted to the money input and output port 1 of the paper money input and output machine, and is structured such as to function at a
10 time of taking the paper money input by the customer at a time of the money input deal in the inner portion of the apparatus from the money input and output port 1, in the automatic machine such as the ATM or the like.

Fig. 2 is a schematic view of a feed control
15 mechanism provided in the money input and output port 1. A drive force is transmitted to a pick roller 13 and a feed roller 14 by rotating a feed motor 12 in a forward direction in a state in which a pressing plate 11 applies a pressure to the paper sheets, one paper
20 money is separated from the paper money bundle, passes between the feed roller 14 and the gate roller 15, and reaches a plurality of feed sensors 17 arranged vertically to a feeding direction. The rotation of the feed motor 2 is stopped at a time of a fixed amount of
25 drive after the paper money reaches the feed sensors 17. Since a leading end of the paper money passes through the feed sensors 17 and reaches a range of a carriage motor drive at this timing, the paper money is

thereafter carried on the basis of the carriage motor drive. A feed process control for one paper sheet is carried out until a trailing end of the paper money passes through the feed sensors 17 and is driven at a
5 fixed amount. Thereafter, the feed process is carried out one by one in the same manner until all the paper moneys input to the money input and output port 1 go out of existence.

For example, in the case that about one
10 hundred of paper moneys are bundled by the band, the rubber band or the like (a paper money bundle) or a large foreign material exists in Fig. 3 in the feed mechanism, the paper money bundle is pushed bundle by bundle on the basis of the drive of the feed motor 12,
15 however, the paper money bundle can not pass between the feed roller 14 and the gate roller 15 and drops down together with the feed roller 14 and the gate roller 15, and the foreign material detecting sensor 16 shields light (a bar light shielding the foreign
20 material detecting sensor 16 is connected to a main body by a spring 18, and does not come down by its own weight of the rollers). In the case that the foreign material detecting sensor 16 shields light, it determines to detect a foreign material, and stops the
25 feed motor 12 so as to prevent the paper money from being fed any more.

In Fig. 3, in the case that the leading end of the paper sheets does not reach the feed sensor 17

within a predetermined time after starting the drive of the feed motor 12, "nonprocess runout" is determined, and the feed is stopped. Since it takes a long time to feed the foreign material in the case that the foreign material is input, "nonprocess runout" is determined even if the foreign material detecting sensor 16 does not shield light, and the paper money is not fed out any more by stopping the feed motor 12.

Further, in the case that about ten paper moneys are input, and are bundled by a staple of a stapler, a rubber band, a clip or the like, they pass between the feed roller 14 and the gate roller 15 by force, the paper moneys are scattered so as to be broken, and the staple of the stapler, the clip, the rubber band or the like is mixed into the inner portion of the device, thereby causing a breakage of the device.

In this case, about ten paper sheets bundled by the staple of the stapler, the rubber band, the clip or the like are not loaded by feeding out on the basis of a feed control motion (hereinafter, refer to as a bundle feeding detection) with respect to the paper money bundle.

A block associated with this feed control is shown in Fig. 5. In Fig. 5, a control portion 30 includes a CPU 30-a for executing a whole control, a ROM (program) 30-b for storing a control program, and a RAM 30-c for executing the control program. Further,

it is constituted by a ROM (for an operational memory) 31 for storing a setting whether or not an operation of the feed control operation is carried out, an IO (a feed mechanism) 32 including a pressing plate motor 32-
5 a for carrying out the feed control, and an IO (a user I/F) 33 having a 7-segment LED 33-a for carrying out an operational setting of the feed control operation of the present invention and a button 33-b. Within the ROM (program) 30-b, there are stored a feed control
10 logic and a monitor value at a normal time, and a feed control logic and a monitor value at a time of carrying out the feed control operation of the present invention.

Fig. 6 shows a control flow chart of a
15 processing motion before the feed of the feed control. An operational information is read from the ROM (for the operational memory) 31 at a time of starting the paper money input and output machine by turning on power (S1), and whether the bundle feed detection is
20 effective or ineffective is stored on the basis of the result (S2 and S3).

The setting whether the bundle feed detection is effective or ineffective is carried out on the assumption that the setting is changed per country or
25 region, by paying attention to the fact that in a region which is not accustomed to a money input deal overseas, a lot of people inputs a paper money bundle which can not be separated, such as ten sheets of paper

sheets fastened by the staple of the stapler, the clip or the rubber band, however, may be structured such as to automatically switch the operational setting by the paper money input and output machine in the case that a
5 trouble of the paper money input and output machine and the paper money which is not accepted at a time of inputting the money frequently occur, or may be structured such as to switch the operational setting per region, office hour, deal or the like on the basis
10 of an instruction from a host terminal instructing the control to the paper money input and output machine.

Fig. 7 shows a flow chart of a processing motion at a feeding time of the feed control in the bundle feed detection. After the carrier path motor is
15 started, the pressing plate motor 32-a moving the pressing plate 11 is rotated in a direction pinching the paper sheets (S11). Thereafter, if the bundle feed detection is effective (Yes in S12), the step makes "nonprocess runout monitor value" corresponding to a
20 necessary time for determining that the paper money does not reach the feed sensor 17 less than a value after the second sheet (S13). In an example in Fig. 7, the nonprocess runout monitor value is set to "100ms". Further, the step stops the pressing plate motor 32-a
25 rotating the pressing plate 11 (S14). Accordingly, the step stops the pressing plate motor 32-a moving the pressing plate 11 at a time of feeding the first paper so as to make the pressing force ineffective.

Next, the step rotates the feed motor 12 in a direction (a forward direction) in which the paper sheets are fed and starts monitoring the nonprocess runout (S15). Thereafter, the step periodically
5 monitors whether or not the foreign material detecting sensor 16 shields light (S16), whether or not the nonprocess runout monitor reaches a predetermined time (S17), and whether or not the paper money reaches the feed sensor 17 (S19). In the case that the bundle
10 detection is effective and the first feed is carried out, the necessary time for the nonprocess runout of the feed sensor 17 is set to a shorter time than the second paper, for example, 100 ms in the step S13 of Fig. 7. In the case that the foreign material
15 detecting sensor 16 shields light (Yes in S16), the step stops the feed motor 12 (S18), and finishes the process. Further, in the case that the nonprocess runout monitor gets over the predetermined time (Yes in S17), the step stops the feed motor 12 (S18), and
20 finishes the process. In the case that the paper money reaches the feed sensor 17 (Yes in S19), the step stops the feed motor 12 after a fixed time (S20), waits an elapse of a fixed time after the paper money passes (S21), and thereafter checks whether or not the next
25 feed paper money exists (S22). In the case that the next feed is not necessary (Yes in S22), the step finishes the feed, and in the case that the next feed is necessary (No in S22) and the bundle feed detection

is effective (Yes in S23), the step rotates the pressing plate motor 32-a moving the pressing plate 11 in the direction pinching the paper sheets (S24), and sets the nonprocess runout monitor value to a value
5 (350 ms in the example of Fig. 7) after the second paper on and after (S25). In other words, the step applies the pressure as the control for feeding the second paper on and after, and turns back the nonprocess runout monitor value. The step thereafter
10 rotates the feed motor 12 in the forward direction, and carries out the feed of the second paper on and after.

As mentioned above, the control of the first paper feed does not feed the paper money bundle which can not be separated, and is differentiated from the
15 control for feeding the second paper on and after.

In accordance with the control mentioned above, it is possible to stop the pressing to the feed portion with regard to the first paper feed, execute the control for making the feed force weak, and
20 immediately stop the carrier drive at a time of detecting an abnormality on the basis of the control for making a nonprocess runout determination value (a timing determining that the paper does not reach the feed sensor so as to stop the feed) of the first paper
25 money shorter than the second paper on and after by the foreign material detecting sensor 16, whereby it is possible to prevent the paper money bundle from being thereafter fed. For example, it is possible to prevent

about ten sheets of paper sheets which are fastened by the staple of the stapler, the clip or the rubber band, and can not be separated, this matter existing frequently overseas from being broken, or prevent the paper money bundle from being scattered in the feed 5 portion, whereby the paper money is broken, and prevent the foreign material such as the clip or the like bundling the paper money bundle from being mixed into the inner portion of the device, whereby the device is 10 broken.

When the paper sheets feeding apparatus mentioned above is applied to the ATM, the paper sheets feeding apparatus stops the feeding without generating the breakage of the paper sheets and the mixing of the 15 foreign material into the inner portion of the device even in the case that the customer erroneously input the paper sheets bundle to the money input and output port 1. In the ATM, it is expected that the customer checks the paper sheets and the normal paper money is 20 input, by carrying out a guidance urging the customer to check and input again the paper sheets, for example, in accordance with a screen as shown in Fig. 8 installed in the ATM or a voice. Further, in accordance with this display, there is an effect that 25 the customer can recognize that the paper money bundle is inhibited from being input to the money input and output port 1.

In the present embodiment, there is carried

out the change of the predetermined time for
"nonprocess runout" of the paper money or the paper
money bundle detection on the basis of the change of
the pressing force, however, the structure may be made
5 such as to decelerate a rotating speed of the feed
motor 12 at a time of feeding out the first sheet,
whereby the feed motor can immediately stop, or the
structure may be made such that the method of detecting
the great posture change and the deformation by the
10 feed sensor 17 at a time of feeding out the first sheet
is set severer than the second sheet on and after,
whereby a detecting precision of the abnormal medium of
the first paper money is increased, in addition to the
structure mentioned above.

15 Further, the medium is set on the assumption
that the bundle is constituted by about ten paper money
sheets which can not be separated, however, the medium
may be set to have the same thickness, or may be used
as a detection of mediums having different thicknesses
20 by changing a monitoring time of the first sheet feed,
and an adjustment of the pressing.

 As in the present embodiment, since it is
possible to immediately stop the carrier drive in the
case of detecting the abnormality and it is possible to
25 prevent the paper money bundle from being fed
thereafter by controlling so as to make the feed force
weak by stopping the pressing force to the feed portion
with regard to the first sheet feed, or controlling so

as to make the nonprocess runout determining value (the timing for determining that the sheet does not reach the feed sensor so as to stop the feed) of the first paper money by the foreign material detecting sensor 16
5 shorter than the second sheet on and after, it is possible to prevent about ten sheets of paper sheets which are fastened by the staple of the stapler, the clip or the rubber band, and can not be separated, this matter existing frequently overseas from being broken,
10 or prevent the paper money bundle from being scattered in the feed portion, whereby the paper money is broken, and prevent the foreign material such as the clip or the like bundling the paper money bundle from being mixed into the inner portion of the device, whereby the
15 device is broken.

Further, since there are a case that the paper money bundle is frequently input and a contrary case in country, region and the like, the apparatus is structured such as to have a mechanism for switching
20 the execution of the bundle detection. Accordingly, in the case that the paper money bundle is frequently input, the paper money bundle is easily returned by executing the bundle detection, and in the case that the paper money bundle is not input, it is possible to
25 execute the normal feed.

As the other applied embodiments of the present embodiment, there are the following embodiments.

In a paper sheets storing apparatus constituted by a pressing means pressing laminated sheet papers in a thickness direction, a one-sheet separating means separating the pressed paper sheets one by one so as to feed and carry to the next stage, and a determining means determining whether or not the one paper sheet fed out from the one-sheet separating means is a normal paper sheet, and storing the paper sheet determined to be normal by the determining means in an inner portion, a paper sheets breakage and a device breakage due to the mixture of the foreign material such as the clip, the staple of the stapler or the like bundling the paper sheets bundle by setting a means differentiating the feed carrier control of the one paper sheet from the second sheet on and after.

For one thing, since the pressing force of the pressing plate 1 at a time of feeding the first sheet is made weaker than the pressing force at a time of feeding the second sheet on and after, and the pressing force becomes weak, the force for separating one sheet from the paper sheets at a time of feeding comes down, the feeding speed comes down, and the effect of immediately carrying out the feed stop and the pressing force become weak. Accordingly, the paper sheets bundle bundled by the staple of the stapler, the clip or the rubber band is hard to be separated, and is fed as the bundle, thereby being easily detected by the foreign material detecting sensor 16. Therefore, the

feed can be quickly stopped at a time of detecting the paper sheets bundle which can not be separated, thereby preventing the paper sheets bundle from being fed.

Further, the structure may be made such as to
5 make the predetermined time for stopping the feed at a time of detecting that the first sheet feeding medium does not reach the feed sensor within the predetermined time shorter than the predetermined time for the second sheet on and after, whereby it is possible to quickly
10 stop the feeding at a time of detecting the paper sheets bundle on the basis of the shortened predetermined time, thereby preventing the paper sheets bundle from being fed.

CLAIMS:

1. A paper sheets feeding apparatus feeding and storing paper sheets, comprising:
 - a pressing means pressing paper sheets to be fed;
 - a separating means separating and feeding the paper sheets pressed by said pressing means;
 - a first detecting means detecting whether or not the paper sheets feed by said separating means is a normal feed; and
 - a control means differently control a paper sheets feed in the case that a detected result by said first detecting means is not a normal feed, and a paper sheets feed in the case that said detected result is the normal feed.
2. A paper sheets feeding apparatus as claimed in claim 1, wherein said control means controls in such a manner as to make a pressing force applied to the paper sheets by said pressing means in the paper sheets feed in the case that the detected result by said first detecting means is not the normal feed lower than a pressing force applied to the paper sheets by said pressing means in the paper sheets feed in the case that said detected result is the normal feed.
3. A paper sheets feeding apparatus as claimed in claim 1, wherein the paper sheets feeding apparatus is provided with a second detecting means detecting the paper sheets fed by said separating means,

said control means measures an arrival time necessary for the paper sheets fed by said separating means to reach said second detecting means, and

said control means controls so as to stop said feed in the case that the arrival time at a time of feeding the paper sheets is longer than a predetermined value.

4. A paper sheets feeding apparatus as claimed in claim 1, wherein the paper sheets feeding apparatus is provided with a memory means storing an operational information relating to the feed control of said control means, and

said control means carries out said feed control in accordance with the operational information stored in said memory means.

5. A paper sheets feeding apparatus as claimed in claim 4, wherein the paper sheets feeding apparatus is provided with a second detecting means detecting the paper sheets fed by said separating means,

said control means measures an arrival time necessary for the paper sheets fed by said separating means to reach said second detecting means,

said control means controls so as to stop said feed in the case that the arrival time at a time of feeding the paper sheets is longer than a predetermined value, and

said operational information includes an information for setting said predetermined value

smaller than a previously determined value.

6. A paper sheets feeding apparatus as claimed in claim 1, wherein said control means controls so as to stop the feeding operation of the paper sheets by said separating means in the case that the detected result by said first detecting means is not the normal feed.

7. A paper sheets feeding apparatus as claimed in claim 4, wherein the paper sheets feeding apparatus is provided with a second detecting means detecting the paper sheets fed by said separating means, and

 the operational information stored in said memory means includes an information relating to the feed control by said control means with respect to the detection by said second detecting means.