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(54) Mail routing system

System zur Weiterleitung von Poststücken

Système d'acheminement de courrier

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- **U.S.-Postal Service maintenance handbook, 15.04.1990.**

EP 0 500 180 B2

Description

A. BACKGROUND OF THE INVENTION

The invention relates to a routing system for routing physical entities (P) - According to the preamble of claim 1.

Such a routing system is known from US 4 832 204. In the case where the routing system is intended for routing items of mail, the said receiving means are formed by letter boxes and by counters in post offices via which items of mail are presented for despatch to a destination address which is usually provided on the item of mail. The delivery to the destination address is carried out by means of post office boxes in post offices which are periodically emptied by the addressees and by means of a delivery organisation which delivers the items of mail 'to the door'. In the case of entities other than items of mail, these are processed in a similar way. Although use is made of an organisation of people and technical means in the introduction into the routing system and the discharge therefrom, the actual routing largely takes place in so-called forwarding centres (FCs) using technical, largely automatically operating means, such as coding and sorting machines. According to the present prior art, the destination address which is provided on the item of mail is used throughout the entire process to determine the destination to which the item of mail has to be sent.

At the beginning of the routing process, a machine-readable (bar) code derived directly from the address of the items of mail (i.e. from their postcode) is printed on the items of mail by means of a so-called coding machine. Said machine-readable destination code is used in the subsequent routing process wherever the routing is carried out by a machine. That is the case, in particular, in the so-called mail sorting machines where the items of mail presented are sorted in accordance with their (main) destination indicated by their post code. After this sorting, the resultant 'bundles' of mail are despatched to their main destination where they undergo a further sorting in accordance with the final destination and are ultimately delivered to their final destinations. Just as in the case of machine sorting, wherever the sorting is now (still) carried out by hand, (direct) use is always made of the address provided by the sender on the items of mail. In the entire routing process, use is therefore always made of the address provided on the items of mail, either in converted form (bar code) or in unconverted form.

From US 4 832 204 a systeem is known in which the destination information of entities presented to the routing system (for example, items of mail in a mail routing system) is converted at an early stage of the routing process into electronic control code signals with which said routing system is then subsequently controlled, which offers the routing system many more possibilities In the known system first conversion means capable of converting, for each entity, at least a part of the destination address into a corresponding electronic first control code signal (c1) are connected to the receiving means, and that second conversion means capable of converting, under the control of conversion parameter signals, the first control code signal into a second control code signal are connected to said first conversion means which second control code signal is fed to the routing means to control said routing means. In this way, the routing within the system can be carried out in the electronic domain. As a result, it is possible to introduce changes into the destination address (delivery address) and/or additional requirements, for example with regard to the time of delivery, by electronic means operated by a system operator or supervisor of the system.

B. SUMMARY OF THE INVENTION

To facilitate said (outside) users of the routing system to introduce changes in the destination parameters of said (postal) entities in a dynamic, online way the invention provides said second conversion means to be capable of carrying out said conversion under the control of electronic conversion parameter signals (p) to be received from said (first or second) users. As a result, it is possible to alter the destination of an entity or to introduce additional conditions into it, such as in relation to the time of delivery. online, directly by the users theirselves. This conversion (changing and/or supplementing) of the original control code signal into a new control code signal is controlled by means of conversion parameter signals, which originate from the entity despatchers' side or from the entity recipients' side. Thus, it is possible that a despatcher of an item of mail indicates, by means of transmitting a conversion parameter signal to the routing system, that the item of mail he has fed to the system must be delivered within a specified period of time to the recipient concerned. Similarly, it is possible for a (potential) recipient to transmit to the routing system in the same way that his mail must not be delivered outside a specified period of time or that his mail can be delivered to one delivery address during a specified time and to another outside thereof. It will be clear that this type of options can signify a good contribution to the market and customer orientation of the routing system.

C. EXEMPLARY EMBODIMENTS

Figures

Figure 1 shows an exemplary embodiment of the invention.

Figures 2 and 3 each show a more detailed elaboration of a section of the exemplary embodiment shown in Figure 1.

Figure 4 shows a more detailed elaboration of the exemplary embodiment shown in Figure 1 in its entirety.

Description

Figure 1 shows an exemplary embodiment of the routing system RS according to the invention. Said routing system RS comprises routing means R (inter alia, comprising sorting machines), first conversion means C1, second conversion means C2 and control means Ctr belonging to the routing means. The routing system RS furthermore comprises receiving means I and delivery means O1...O4. The routing system RS is furthermore connected via a node X to a transmission network T. It is assumed below that the routing system RS is a routing system for items of mail P.

The items of mail P to be fed to the routing system RS are fed thereto via the receiving means I. Said receiving means may be formed by, for example, letter boxes or, (counters of) post offices. According to the present mail routing practice, the items of mail (letters, postal packages) are transported from the post office to so-called forwarding centres. After the items of mail have been collected in this way via the post offices, they are routed (sorted) in accordance with their destinations in the forwarding centres. Usually said destinations are written, typed or printed on the letters or postal packages. Wherever use is always made of said addresses provided on the items of mail by the present mail traffic processing, an electronic control code signal is now derived, according to the invention, from the address at as early a stage as possible. As implemented in the present mail organisation, this will be performed inside a forwarding centre. Control code signals are derived from the destination address a in the first conversion means C1. The control code signal c1 resulting from the first conversion means C1 is then fed to second conversion means C2, where the control code signal c1 originating from the first conversion means can be converted under the influence of parameter signals p fed to the second conversion means C2. This conversion may signify, for example, that, if the control code signal c1 has a particular value (represents a particular destination address), said value has to be converted into another value in the second conversion means C2, as a result of which the item of mail concerned will, for example, be routed to a final destination (delivery address) other than the original destination address a provided on the item of mail P. In this way, it is possible, inter alia, to arrange that items of mail which are intended for a person or enterprise which has moved in the meantime, are forwarded. This forwarding may also correspond to the concept, known from telephony, of 'follow me', items of mail now being delivered to an address, desired by the recipient, other than the original destination address indicated on the item of mail by the sender under the influence of a parameter code signal set by the recipient. A control code, under the influence of which the item of mail concerned can only be delivered to the destination address at a particular time, may furthermore be added to a first control code signal c1 by means of the parameter signals p presented to the second conversion means C2. A parameter signal p may also indicate that the item of mail represented by the control code signal c2 must be delivered with, for example, the highest priority.

However, it is also possible (and that will be the case for a large portion of the items of mail) that, on the whole, no actual conversion of the control code signal c1 takes place in the second conversion means C2; most of the items of mail will require nothing other than a "normal" processing. However, the system according to the invention offers a large number of possibilities (as a result of the said parameter control) for controlling the items of mail to be despatched in accordance with the desire either of the sender or of the (potential) recipient.

The control code signal c2 resulting from the second conversion means C2 is fed to the control means Ctr. This is, for example, a control computer which provides for the control of the routing means R. In this case, the control computer Ctr is controlled by the control code signals c2.

Via a node X, the second conversion means C2 are connected to a transmission network T via which parameter signals p(1) or p(2) can be fed to the second conversion means C2. In the figure, p(1) represents a parameter signal which is fed from the side of the despatcher of an item of mail via the transmission network T to the conversion means C2 with the intention of routing the items of mail (in this connection, a large number of items of mail per unit time, for example originating from a mass-media-oriented enterprise comes to mind) to the desired destination by means of the parameter control of the second conversion means C2 and (optionally) with the desired speed (priority) through the routing means and of arranging for them to be delivered (optionally) at a desired time via the delivery means O1...O4. Parameter signals which are represented by p(2), can also be despatched from the other side of the routing system. The parameter signals p to be fed to the routing system, i.e. to the second conversion means C2, from the side of the recipients of the items of mail can be used to arrange for the items of mail to be received (in particular, this may be of importance for enterprises which receive large quantities of items of mail) to be delivered in a form desired by said recipient (for example converted into an electronic message, as proposed in the Applicant's application NL90.01534) and at a desired time at said recipient's premises. A further possibility is that the control means Ctr provide information (by means of information code signals i) relating, for example, to the status of the items of mail present in the routing system, i.e. in the routing means. For this purpose, an information signal i is then fed from the control means Ctr to the second conversion means C2 and via the latter and the node X to the transmission network T. The status information of the items of mail which are being handled or processed inside the routing means can be supplied from said transmission network T to

interested parties (and entitled to it).

Figure 2 shows a more detailed elaboration of, in particular, the first conversion means C1. An item of mail is fed to the routing system and completely or partially scanned by an optical scanning device S, the destination address and possibly the sender, as well as any further codes, such as a code for the purpose of converting the content of the item of mail into an electronic message as described in the said application of the Applicant, are converted into an electrical image signal. The scanning device may be, for example, a video camera which picks up the address side of the item of mail and converts it into the image signal im. In order to be able to relocate the item of mail, which is temporarily buffered, it is given an identification code generated by an identification code generator ID. Said identification code is allocated both to the item of mail itself and to the image signal picked up from said item of mail. A printing device P1 which prints said identification code on the item of mail provides the identification code on the item of mail. Thereafter the item of mail is temporarily buffered in a buffer device B. The image signal im is converted in the meantime into a first control code signal c1. For this purpose a number of conversion devices C3 are used. Said conversion devices may be different in nature and correspond to the different forms in which the address (and optionally sender) information is provided on the items of mail, namely in machine-readable script, in 'type script' or in hand-written script. In order to be able to provide for the conversion of said information in all cases, the items of mail are always fed through a number of conversion devices C3, a first conversion device C3 being solely capable of converting machine-readable script, a second for "recognising", in particular, typed (or printed) characters making use of more or less calculation-intensive algorithms, and a third for the manual conversion of, in particular, hand-written addresses and the like which are found not to be capable of being converted by any of the preceding conversion devices C3. The processing of the image information signal im in this way results in a routing code signal r for each item of mail. Just as the image information signal im was always accompanied by the identification code of the item of mail concerned, the control code signal is also accompanied by the identification code id of the item of mail concerned after the conversion in the conversion device C3. The control code signal c1 and the identification code signal id are now fed to the second conversion means C2 where, as was indicated above, said routing code signals can be converted into changed or supplemented routing code signals c2. The control code signal c2 converted in this way by the second conversion means C2 is fed, together with its identification code id, to the control means Ctr which control the routing device R. Said control means Ctr now send a signal to the buffer device B containing the identification code id of the item of mail stored in said buffer device B, after receipt of which said buffer device (for example a buffer device as described in the Applicant's application NL89.02846) releases said item of mail indicated by the identification code id, as a result of which it ends up in the routing means R. Having arrived there, the item of mail is routed, under the influence of a routing code signal r derived from the second control code signal c2, to the outlet of the routing means R, for example outlet O3, indicated by said control code signal.

Figure 3 shows a possible implementation of the second conversion means C2. In this design, the two conversion means C2 comprise a control device Ctr1 and an information device (data base) Db. Stored in said information device Db are the control codes which correspond to the control code signals c1 which have actually to be converted (or supplemented) either into a control code signal which indicates a different delivery address or supplemented with requirements relating, for example, to the time of delivery or the delivery speed or delivery priority or relating to the delivery form. The conversion parameters indicating the changes and/or supplements are stored in the information device Db and arranged in accordance with a first control code to which they relate. As soon as a first control code signal c1 comes from the first control means C1, it is compared (under the control of the control device Ctr1) with the various first control codes c1 stored in the information device Db. If a corresponding control code c1 is present, the associated conversion information specified in the conversion parameters is read out and the control code signal c1 is converted in this way into a new second control signal c2, said second control code signal c2 thus indicating, for example, a different delivery address and/or being supplemented with particular delivery conditions, particularly relating to the time and/or speed and/or manner or form of delivery. If a first control code c1 does not occur in the information device Db, the first control code signal c1 is converted without change or supplement into a second control code signal c2; in that case, the first control code signal and second control signal are therefore identical to each other in terms of content. Parameter code signals p for setting the second conversion device C2 may be fed to the control device Ctr1 from the transmission network T via the node X. On the basis of such a code signal p, the control device Ctr1 carries out a mutation (writing-in, change, additions or removal) in the information device Db. In this connection, it is pointed out that both the node X and the control device Ctr1 are provided with (known) protection means for exclusively granting access to the control device Ctr1 and to the relevant part of the information device Db to persons entitled thereto, as a result of which only those entitled to access can carry out mutations in the information device Db or obtain information (i) about items of mail which are of relevance to them.

Figure 4 shows an exemplary embodiment of the invention formed by elements of the exemplary embodiments shown in the preceding figures. An item of mail P

is received in the routing system RS via the receiving device I and is scanned in the scanning device S, an image signal im being made of the destination address a, or a part thereof (and optionally of the sender's address and/or other notations or codes provided on the item of mail), an identification code id being assigned by the identification code generator ID assigned (labelled) both to the item of mail P and to the image signal im. The image signal im is converted by means of one of the conversion devices C3 into a first control code signal c1. In the second conversion means C2, said control code signal c1 is converted, under the influence of the parameter signals p(1,2) fed to said second conversion means C2, into a second control code signal c2 which is fed to control means Ctri which use said control code signal c2 to form routing signals r which are fed to the routing means for the controlling thereof. In this figure, the routing means are represented by a routing device Ri which is controlled by a control device Ctri associated with the routing device Ri on one side of the routing network R and furthermore a routing device Ro at the side of the delivery address of the item of mail concerned, which routing device Ro is controlled by a control device Ctro associated with said routing device Ro. The control code signals c2 are presented both to the control device Ctri for controlling the routing device Ri at the input side and (via a transmission network T1) to the control device Ctro to control the routing device Ro at the output side of the routing means R. Under the control of the routing code signals r and the associated identification code signal id, the item of mail stored in the buffer device Bi is released and routed through the routing device Ri in the direction of the outlet routing device Ro. At the receiving side of the routing means R, the item of mail is received and stored in a buffer device Bo. After its identification code id has been received from the control device Ctro, the item of mail is released from said buffer device Bo and sent to its delivery address O3 by the routing device Ro under the control of its routing code signal r. Incorporated between the buffer device Bo and the routing device Ro there is furthermore a printer Po. On those items of mail whose converted delivery address differs from the original destination address, said printer Po prints that new delivery address in normal readable script. Even if the delivery address is the same as the original address after the conversion but supplementary conditions have been introduced, via the second conversion mentioned, with regard to the delivery, in particular the time of delivery, said conditions are provided on said item of mail by the printer Po in normal readable script. As a result of this printing of the new destination address and/or the delivery requirements by the printer Po, the mail deliverers (who ultimately form the last link in the delivery of items of mail) are instructed by the printed information in accordance with the instructions indicated by the conversion parameters.

Claims

1. Routing system for routing physical entities (P) received normally by post offices from a first user, such as items of mail and the like, which are each provided with a destination address (a) of a second user, which routing system comprises receiving means (I) for receiving said entities in the routing system, delivery means (O) for delivering said entities at a delivery address outside the routing system, and routing means (R) for routing each of said entities from the receiving means to the delivery means under the control of control code signals (c1, c2), wherein first conversion means (C1), capable of converting, for each entity, at least a part of the destination address (a) into a corresponding electronic first control code signal (c1), are connected to the receiving means (I), and wherein second conversion means (C2), capable of converting, under the control of electronic conversion parameter signals the first control code signal (c1) into a second control code signal (c2), are connected to said first conversion means (C1), which second control code signal (C2) is fed to the routing means (R) to control said routing means. characterized in that said second conversion means (C2) are capable of carrying out said conversion under the control of electronic conversion parameters (p) to be received from said first user or said second user,

2. Routing system according to Claim 1, characterised in that one or more of the conversion parameter signals (p) contains a code which indicates the delivery address of the entity concerned.

3. Routing device according to Claim 1, characterised in that one or more of the conversion parameter signals (p) contains a code which indicates the delivery time of the entity concerned.

4. Routing system according to Claim 1, characterised in that one or more of the conversion parameter signals (p) originate from outside the routing system (RS) and are transmitted to the second conversion means (C2) via transmission means (T).

5. Routing system according to Claim 1, characterised by an identification code generator (ID) which comprises means for assigning an identification code (id) to each of the items of mail (P) fed to the routing system (RS),

   a scanning device (S) which is connected to the feed means (I) and to the identification code generator and which comprises means for scanning the destination address of at least a part of the items of mail presented and converting it into an electronic image signal (im) of

said destination address section and for coupling said image signal to the identification code assigned to said item of mail,

one or more conversion devices (C3), each connected to the scanning device and, together therewith, forming part of the said first conversion means (C1) and containing means for converting the said electronic image signal into the said electronic first control signal (c1).

Patentansprüche

1. System zum Weiterleiten von physischen Gebilden (P), die üblicherweise von Postämtern von einem ersten Benutzer empfangen werden, wie zum Beispiel Poststücke und dergleichen, von denen jedes mit einer Bestimmungsortadresse (a) eines zweiten Benutzers versehen ist, wobei das Weiterleitungssystem Empfangsmittel (I) zum Empfangen dieser Gebilde im Weiterleitungssystem, Zustellmittel (0) zum Zustellen dieser Gebilde an eine Zustelladresse ausserhalb des Weiterleitungssystems und Weiterleitungsmittel (R) zum Weiterleiten jedes dieser Gebilde von den Empfangsmitteln zu den Zustellmitteln unter Steuerung von Steuercodesignalen (cl, c2) umfasst, wobei an die Empfangsmittel (I) erste Umwandlungsmittel (C1) angeschlossen sind, die in der Lage sind, für jedes Gebilde mindestens einen Teil der Bestimmungsortadresse (a) in ein entsprechendes elektronisches erstes Steuercodesignal (c1) umzuwandeln, und wobei an diese ersten Umwandlungsmittel (C1) zweite Umwandlungsmittel (C2) angeschlossen sind, die in der Lage sind, unter Steuerung von elektronischen Umwandlungsparametersignalen (p) das erste Steuercodesignal (c1) in ein zweites Steuercodesignal (c2) umzuwandeln, wobei dieses zweite Steuercodesignal (c2) den Weiterleitungsmitteln (R) zugeführt wird, um diese Weiterleitungsmittel zu steuern, **dadurch gekennzeichnet,** dass die zweiten Umwandlungsmittel (C2) in der Lage sind, die besagte Umwandlung unter der Steuerung der elektronischen Umwandlungsparameter auszuführen, die von dem ersten Benutzer oder von dem zweiten Benutzer zu empfangen sind.

2. Weiterleitungssystem nach Anspruch 1, dadurch gekennzeichnet, dass ein oder mehrere Umwandlungsparametersignale (p) einen Code enthalten, der die Zustelladresse des betreffenden Gebildes angibt.

3. Weiterleitungssystem nach Anspruch 1, dadurch gekennzeichnet, dass ein oder mehrere Umwandlungsparametersignale (p) einen Code enthalten, der die Zustellzeit des betreffenden Gebildes angibt.

4. Weiterleitungssystem nach Anspruch 1, dadurch gekennzeichnet, dass ein oder mehrere Umwandlungsparametersignale (p) von ausserhalb das Weiterleitungssystem (RS) herstellen und an die zweiten Umwandlungsmittel (C2) über Übertragungsmittel (T) übertragen werden.

5. Weiterleitungssystem nach Anspruch 1, gekennzeichnet durch einen Identifikationscodengenerator (ID), der Mittel zum Zuteilen eines Identifiktationscodes (id) an jedes der Poststücke (P) umfasst, die dem Weiterleitungssystem (RS) zugeführt werden, eine Abtastvorrichtung (S), die mit den Zufuhrmitteln (I) und dem Identifikationscodengenerator verbunden ist, und die Mittel umfasst zum Antasten der Bestimmungsortadresse von mindestens einem Teil der zugeführten Poststücke, und zum Umwandeln dieser in ein elektronisches Bildsignal (im) des Bestimmungsortadressenabschnitts, und zum Koppeln dieses Bildsignals mit dem diesem Poststück zugeteilten Identifikationscode, eine oder mehrere Umwandlungsvorrichtungen (C3), von denen jede mit der Abtastvorrichtung verbunden ist und mit dieser zusammen einen Teil dieser ersten Umwandlungsmittel (C1) bildet und Mittel enthält zum Umwandeln des elektronischen Bildsignals in das elektronische erste Steuersignal (c1).

Revendications

1. Système d'acheminement pour acheminer des entités physiques (P), reçues normalement, d'un premier utilisateur, par des bureaux de poste, comme des articles de courrier et analogues, qui sont chacune munies d'une adresse de destination (a), d'un second utilisateur, lequel système d'acheminement comprend des moyens de réception (I) pour recevoir lesdites entités dans le système d'acheminement, des moyens de délivrance (O) pour délivrer lesdites entités à une adresse de délivrance à l'extérieur du système d'acheminement, et des moyens d'acheminement (R) pour acheminer chacune desdites entités, des moyens de réception aux moyens de délivrance sous les ordres de signaux de code de commande (c1, c2), dans lequel des premiers moyens de conversion (C1), capables de convertir, pour chaque entité, au moins une partie de l'adresse de destination (a) en un premier signal électronique de code de commande (c1) correspondant, sont connectés aux moyens de réception (I) ; et dans lequel des seconds moyens de conversion (C2), capables de convertir, sous les ordres de signaux électroniques de paramètre de conversion, le premier signal de code de commande (c1) en un second signal de code de commande (c2), sont connectés auxdits premiers moyens de conversion (C1), lequel second signal de code de commande (c2) est délivré aux moyens

d'acheminement (R) pour commander lesdits moyens d'acheminement, caractérisé en ce que lesdites seconds moyens de conversion (C2) sont capables d'effectuer ladite conversion sous les ordres de paramètres électroniques de conversion (p) à recevoir dudit premier ou dudit second utilisateur.

2. Système d'acheminement selon la revendication 1, caractérisé en ce qu'un ou plusieurs des signaux de paramètre de conversion (p) contiennent un code qui indique l'adresse de délivrance de l'entité concernée.

3. Système d'acheminement selon la revendication 1, caractérisé en ce qu'un ou plusieurs des signaux de paramètre de conversion (p) contiennent un code qui indique l'heure de délivrance de l'entité concernée.

4. Système d'acheminement selon la revendication 1, caractérisé en ce qu'un ou plusieurs des signaux de paramètre de conversion (p) prennent naissance à l'extérieur du système d'acheminement (RS) et sont transmis aux seconds moyens de conversion (C2) par l'intermédiaire d'un moyen de transmission (T).

5. Système d'acheminement selon la revendication 1, caractérisé par un générateur de codes d'identification (ID) qui comprend un moyen pour affecter un code d'identification (id) à chacun des articles de courrier (P) introduits dans le système d'acheminement (RS) ;

un dispositif de lecture (S) qui est connecté aux moyens de réception (I) et au générateur de code d'identification et qui comprend des moyens pour lire l'adresse de destination d'au moins une partie des articles de courrier présentés et pour la convertir en un signal d'image électronique (im) de ladite section d'adresse de destination et pour coupler ledit signal d'image au code d'identification affecté audit article de courrier ;
un ou plusieurs dispositifs de conversion (C3), chacun connecté au dispositif de lecture, et qui comme lui font partie desdits premiers moyens de conversion (C1) et contiennent des moyens pour convertir ledit signal d'image électronique en ledit premier signal électronique de commande (c1).

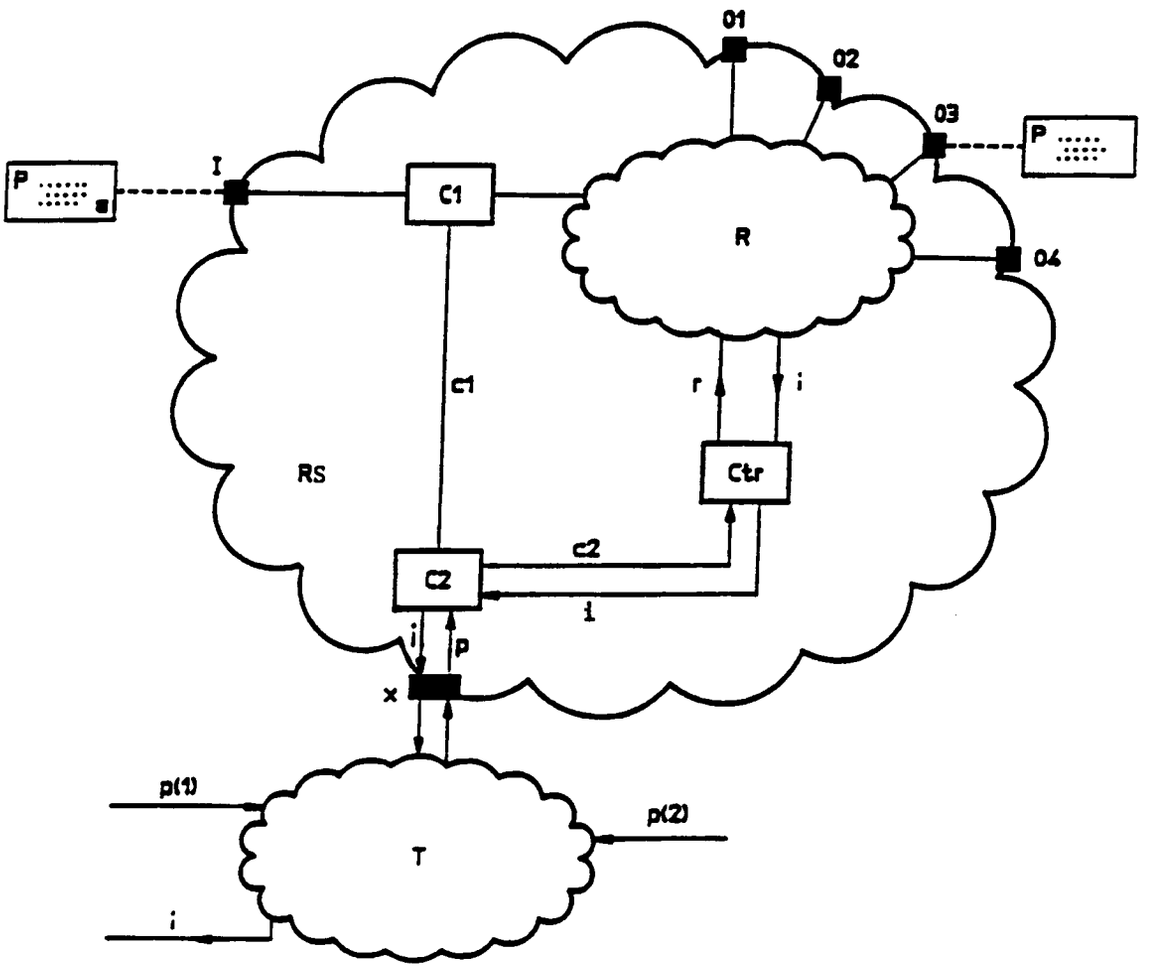


Fig. 1

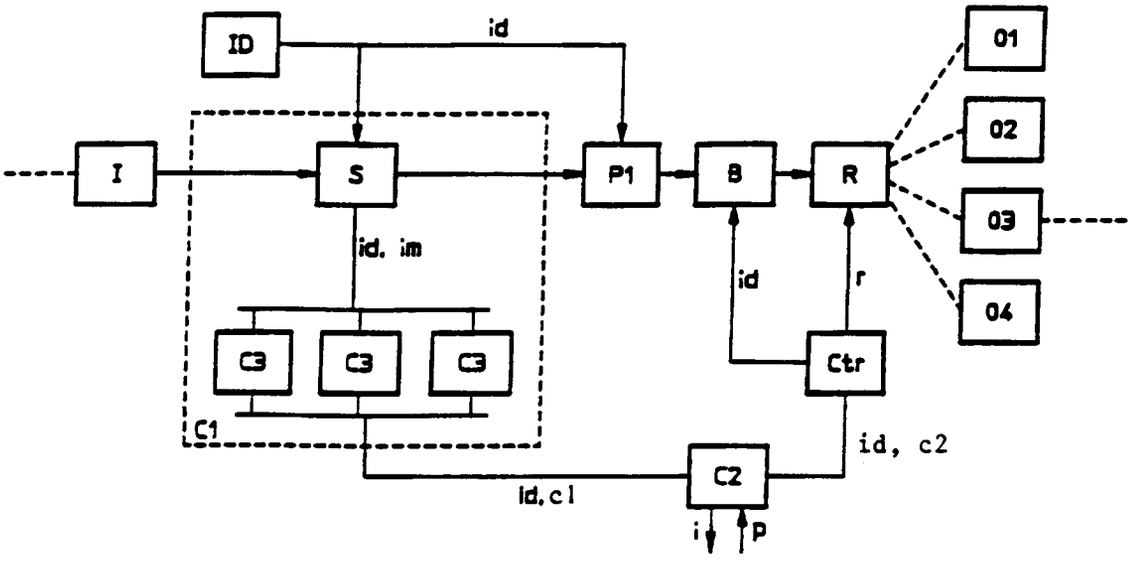

ID
id
01
02
03
04
I
S
P1
B
R
id, im
id
r
C3
C3
C3
Ctr
C1
id, c2
C2
id, c1
i
p

Fig. 2

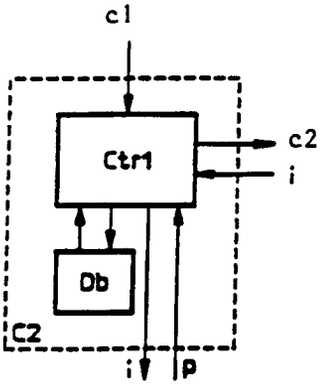

c1
Ctr1
c2
i
Db
C2
i
p

Fig. 3

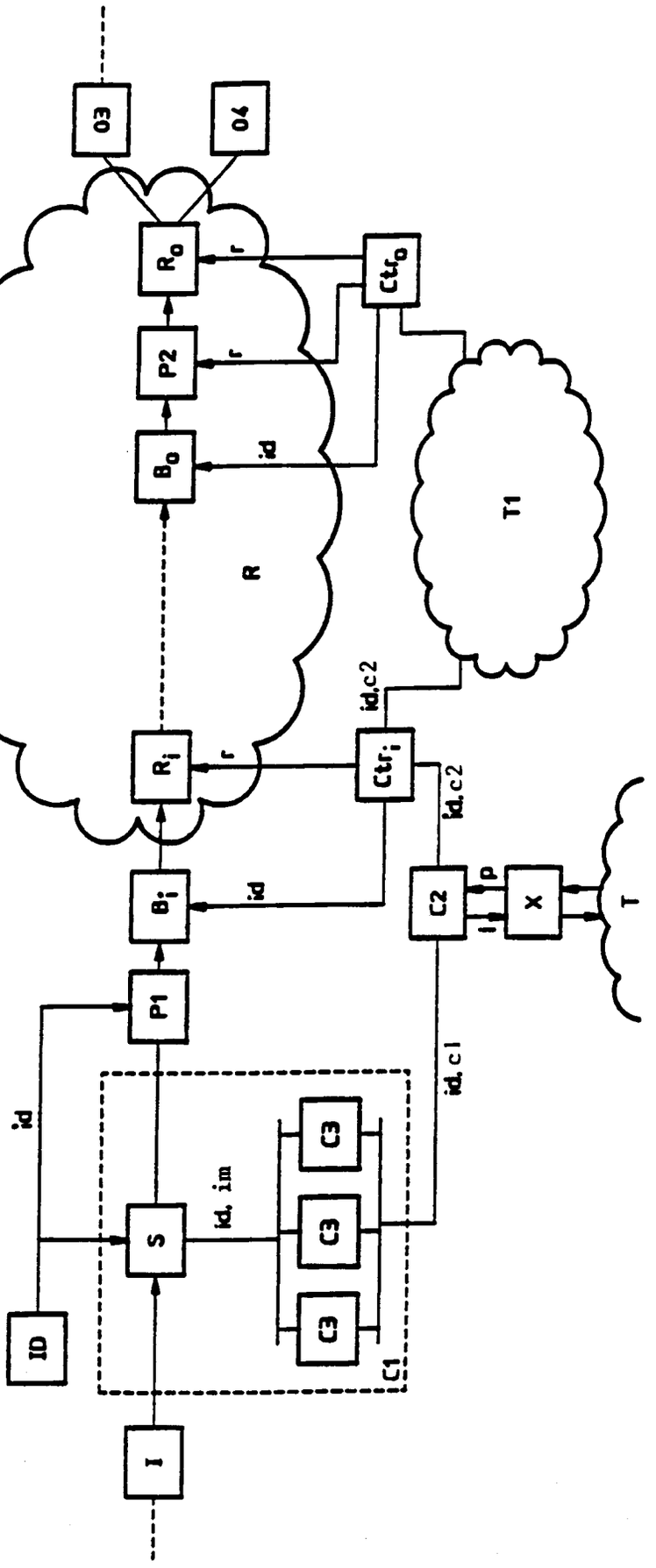

O3
O4
R_0
r
Ctr_0
P2
r
B_0
id
R
T1
id,c2
R_i
r
Ctr_i
id,c2
B_i
id
C2
p
l
X
T
P1
id
id, im
S
C3
C3
C3
C1
ID
I
id, c1

Fig. 4