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D E C I S I O N
of 21 September 1994

Case Number: T 0716/93 - 3.4.2

Application Number: 87302336.0

Publication Number: 0239317

IPC: G03G 15/00, B65H 5/06

Language of the proceedings: EN

Title of invention:
Paper conveying roller for image forming apparatus

Patentee:
SHARP KABUSHIKI KAISHA

Opponent:
BSG Technische Beratungs-Gesellschaft mbH, Esslingen

Headword:
-

Relevant legal norms:
EPC Art. 54, 56, 84, 114(2), 123(2), 123(3)

Keyword:
"Main request: clarity (no)"
"First auxiliary request: clarity (no)"
"Second auxiliary request (after amendments): extension of protection (no)"
"Extension of subject-matter (no)"
"Clarity (yes)"
"Novelty (yes)"
"Inventive step (yes)"

Late filed and not relevant documents disregarded.

Decisions cited:
T 0236/87

Catchword:
-



Case Number: T 0716/93 - 3.4.2

D E C I S I O N
of the Technical Board of Appeal 3.4.2
of 21 September 1994

Appellant:
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Respondent:
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Decision under appeal: Interlocutory decision of the Opposition Division
of the European Patent Office dated 13 May 1993,
posted on 2 June 1993 concerning maintenance of
European patent No. 0 239 317 in amended form.

Composition of the Board:

Chairman: E. Turrini
Members: M. Chomentowski
B. J. Schachenmann

Summary of Facts and Submissions

- I. The Respondent is Proprietor of the European patent No. 0 239 317 (application No. 87 302 336.0) which, following an opposition filed by the Appellant (Opponent) on the grounds that the subject-matter of the claims of the opposed patent lacked novelty or an inventive step having regard in particular to D4 = IBM Technical Disclosure Bulletin, Vol.9, No.4, September 1966, page 414, G.N.Baker et al., "Mounting device for pressure rollers", was maintained in amended form. D1 = DE-A-3041971 and D2 = US-A-1897054 are cited in the European search report.

- II. The Appellant (Opponent) lodged an appeal against this decision. He submitted that the subject-matter of the contested patent as amended had been extended beyond the content of the application as filed, that the protection had also been extended by the amendments, and that said subject-matter was not inventive.

- III. In the communication accompanying the invitation to oral proceedings which had been requested auxiliarily by both parties, the Board of Appeal expressed the opinion that the subject-matter of Claim 1 of the contested decision and of new Claim 1 filed as an auxiliary request by the Respondent both appeared to extend beyond the content of the application as filed, that the subject-matter of Claim 1 of the main request appeared to lack an inventive step having regard to D1, D4 and D2, but that a new main claim based on the auxiliary request and further amended for meeting the objection of additional subject-matter could be allowable in view of the prior art and of the Respondent's arguments.

IV. The Appellant filed during the oral proceedings of 21 September 1994, in supplement to the new prior art document D8 = US-A-3 190 643 which he had filed by letter, a sketch showing his interpretation of the device of Figures 7 and 8 of D2 and three new documents to be introduced into the procedure: D9 = US-A-2 735 536, and D10 = JP-A-59-36039 and D11 = JP-A-56-112143 with English translations thereof, and he requested that the decision under appeal be set aside and that the patent be revoked. The main and two auxiliary requests of the Respondent for maintaining the patent in amended form are based on the following sets of claims submitted at said oral proceedings:

Main request:

Claim 1 reads as follows:

"1. A sheet conveying apparatus in which a sheet is conveyed through the nip between first roller means (11) and second roller means (12) mounted on respective first and second mutually separable body members (B, A), and in which one of said roller means (12) comprises a roller supported by spring means (13) for regulating the pinch pressure applied to the sheet, characterised in that said spring means is constituted by an elongate coil spring (13a, 13b, 13c) extending axially through said roller (12a, 12b, 12c, 12d) rotatably mounted thereon and anchored at its opposite ends with respect to the associated body member."

Claims 2 to 4 are dependent claims and Claim 5 concerns an image recording apparatus having upper and lower body members and a sheet conveying apparatus according to any of Claims 1 to 4.

First auxiliary request:

Claim 1 reads as follows:

"1. A sheet conveying apparatus in which a sheet is conveyed through the nip between first roller means (11) and second roller means (12) mounted on respective first and second mutually separable body members (B, A), and in which one of said roller means (12) is supported by spring means (13) for regulating the pinch pressure applied to the sheet, characterised in that said one of said roller means comprises a plurality of axially aligned rollers (12a, 12b, 12c, 12d), and in that said spring means is constituted by a plurality of aligned elongate coil springs (13a, 13b, 13c) each extending axially through at least one of said rollers (12a, 12b, 12c, 12d) rotatably mounted thereon and each anchored at its opposite ends with respect to the associated body member."

Claims 2 and 3 are dependent claims and Claim 4 concerns an image recording apparatus having upper and lower body members, and a sheet conveying apparatus according to any of Claims 1 to 3.

Second auxiliary request

Claim 1 reads as follows:

"1. An image recording apparatus having a lower body member (A), an upper body member (B) hingedly connected to the lower body member for movement between a lowered, body closed position, and a raised body open position, and a sheet conveying device (8, 15, 11, 12) for conveying a sheet along a sheet feed path in said apparatus, said sheet conveying device comprising first and second roller means (11, 12) constituting drive

means for advancing the sheet and mounted respectively on said upper and lower body members, said first and second roller means forming a nip for the sheet in said body closed position and being separated in said body open position, wherein one of said roller means (12) is spring biased against the other (11) in said body closed position for regulation of the pinch pressure applied to the sheet, characterised in that said first and second roller means (11, 12) are mounted on respective sheet conveying guides (8, 15) which are provided on respective ones of said upper and lower body members and which form said sheet feed path in said body closed position, in that said one of said roller means comprises a plurality of axially aligned rollers (12a, 12b, 12c, 12d), and in that said spring means is constituted by a plurality of aligned elongate coil springs (13a, 13b, 13c) each extending axially through at least one of said rollers (12a, 12b, 12c, 12d) rotatably mounted thereon and each anchored at its opposite ends to a respective pair of support parts on the associated sheet conveying guide (15)."

Claim 2 is a dependent claim.

- V. The Appellant submitted the following arguments in support of his request: The closest prior art document is D10, which relates to an image recording apparatus of the same type as the apparatus in dispute and which also shows an axial, aligned arrangement of a plurality of rollers with corresponding springs. An arrangement of coil springs supporting rollers is shown in D2 or D9. D8 also shows a plurality of rollers supported by axially aligned springs in a sheet conveying apparatus. Therefore, the apparatus in dispute is rendered obvious by combining the teaching of D10 and D2 or, alternatively, of D8 and D2. It is also to be noted that the apparatus in dispute is also rendered obvious by the

combination of D1 and D2, or of D1, D2 and D4, whereby D4 incites to substitute a resilient supporting axis of the rollers for the rigid supporting axis of D1, and whereby the axially aligned arrangement of springs with rollers rotatably mounted thereon of D2 is obviously applied when springs are used for obtaining a resilient supporting rotation axis for the rollers. Therefore, the subject-matter of Claim 1 in all three requests is not inventive.

VI. The Respondent argued substantially as follows: The amendments in the requests should meet the objections of lack of clarity of the Board. D8, D9, D10 and D11 were submitted too late and should be disregarded (see T 0326/87 OJ, EPO, 1992, 522). Contrary to the apparatus in dispute, the image recording apparatus of D1 has an axis supporting the rollers which is rigid and the spring means are not axially aligned coils, but transversal springs at the ends of said axis; said transversal springs have an additional function, which is to maintain said rigid supporting axis in the openings of the body of the apparatus. Therefore, it would not be obvious to take into account the totally different spring and roller supporting structure of D2 for combining with D1. Moreover, the apparatus of the patent in suit has an additional advantage as compared to the apparatus known from D1 in that it allows the pressure applied to the sheets passing through the nip between the sheet feeding rollers to be regulated in a sense transverse to the sheet feeding direction, i.e., along the set of axially aligned rollers, whereby unequal wearing of the different rollers will not adversely affect the uniformity of the pinch pressure across the sheet, which can in due course lead to sheet skewing. Thus, Claim 1 in dispute, in particular of the second auxiliary request, involves an inventive step.

Reasons for the Decision

1. The appeal is admissible.
2. *Main request*
- 2.1 Clarity of Claim 1

As stressed by the Board during the oral proceedings, in the expression "an elongate coil spring extending axially through said roller mounted thereon and anchored at its opposite ends with respect to the associated body member", the words "elongate coil spring extending axially" are to be understood, in combination with the words "through said roller rotatably mounted thereon" as meaning that the axial character of the elongate coil spring is related to the coil spring portion extending through the roller, whereby the elongate coil spring may, outside of said roller, extend in any convenient manner so as to be anchored at its opposite ends with respect to the associated body member; moreover, the expression "with respect to the associated body" also leaves open many possibilities for the location on said associated body where the ends of said elongate coil spring may, directly or indirectly, for instance by attachment to an intermediate transversal spring, be anchored; thus, transversal parts of the elongate coil spring or additional transversal elongate springs, on both sides of said roller, are not excluded by the text of Claim 1 in dispute. Moreover, according to the patent in suit (see in particular column 2, line 58 to column 4, line 11; Figures 1 to 3), an important feature of the invention is that the paper sheet is conveyed in particular by way of the sheet feed rollers (11, 12) and the sheet conveying guides (8, 15), whereby the sheet conveying guides, in particular the parts (8) and (15), are provided at the boundary between the upper and lower

units (A, B) and a sheet conveying path is formed thereby. Without the sheet conveying guides (8, 15), no sheet conveying path is defined in Claim 1 in dispute. However, it is not derivable from the patent in suit how reduction of fluctuations of, in particular, conveying force by the sheet feed rollers and stable paper conveyance can be achieved by the apparatus in dispute when the parts of the elongate coil spring at both sides of the roller are transversal and/or when no sheet conveying path is defined. Therefore, Claim 1 in dispute is not clear in the sense of Article 84 EPC and, thus, the main request is not allowable (Article 102(3) EPC).

3. *First auxiliary request*

3.1 Clarity of Claim 1

The sheet conveying apparatus of Claim 1 of the first auxiliary request differs from the apparatus of the main request in that, in the former one, the roller means does not comprise a roller but a plurality of axially aligned rollers (12a, 12b, 12c, 12d), and the spring means is not constituted by an elongate coil spring, but is constituted by a plurality of aligned elongate coil springs (13a, 13b, 13c) each extending axially through at least one of said rollers (12a, 12b, 12c, 12d) rotatably mounted thereon and each anchored at its opposite ends with respect to the associated body member. Thus, an aligned arrangement according to the same axis of the rollers and of the elongate coil springs is derivable from the claim. However, for the same reasons as those mentioned here above in relation to the main request, the axial character of each elongate coil spring is related to the coil spring portion extending through the rollers, whereby in particular the elongate coil springs located at the ends of said arrangement of rollers may, outside of said end

rollers, extend in any convenient manner so as to be anchored at adequate ends with respect to the associated body member; indeed, here again the expression "with respect to the associated body" also leaves open many possibilities for the location on said associated body where the ends of said elongate coil spring may, directly or indirectly, be anchored; thus, transversal parts of the elongate coil spring, on both sides of said roller, are not excluded by the text of Claim 1 in dispute. Moreover, as in the main request, the claim of the first auxiliary request does not comprise the important feature that the paper sheet is conveyed in particular by way of the sheet feed rollers (11, 12) and the sheet conveying guides (8, 15) provided at the boundary between the upper and lower units (A, B) and forming a sheet conveying path. Therefore, because of this lack of definition of features of the claimed apparatus, which has been stressed by the Board during the oral proceedings, Claim 1 of the first auxiliary request is not clear in the sense of Article 84 EPC and, thus, the first auxiliary request is not allowable (Article 102(3) EPC).

4. *Second auxiliary request*

4.1 Allowability of the amendments

There has been no objection concerning the allowability of the amendments. Claim 1 in dispute results from the combination of Claim 1, dependent Claim 3 and Claim 5, directed to an image recording apparatus having a sheet conveying apparatus according to any of Claims 1 to 4, all as granted; moreover, Claim 1 in dispute comprises features such as the alignment of the elongated coil springs, the sheet conveying guide and the respective pair of support parts for anchoring the coil springs, which are disclosed in the granted patent (see in

particular Figure 1 and the description, column 3, line 34 to column 4, line 11) and which thus result in an apparatus more restricted than the apparatus of the combination of Claims 1 and 5 as granted. Moreover, the same features are disclosed in the application as filed (see Figure 1 and page 7, second paragraph to page 8, third paragraph). Therefore, the Board is satisfied that the claims of the European patent have not been amended during opposition proceedings in such a way as to extend the protection conferred and that, moreover, the European patent has not been amended in such a way that it contains subject-matter which extends beyond the content of the application as filed (Article 123(3) and (2) EPC).

4.2 Clarity of Claim 1

There has been no objection concerning the clarity of Claim 1 in dispute. Claim 1 specifies that, in the image recording apparatus having a lower body member (A), an upper body member (B) hingedly connected to the lower body member for movement between a lowered, body closed position, and a raised body open position, there is a sheet conveying device (8, 15, 11, 12) for conveying a sheet along a sheet feed path in said apparatus; moreover, there are first and second roller means (11, 12) mounted on respective sheet conveying guides (8, 15) which are provided on respective ones of said upper and lower body members and which form said sheet feed path in said body closed position; it is also to be noted that said spring means, which is to be understood as being the means for spring biasing the rollers, is constituted by a plurality of aligned elongate coil springs (13a, 13b, 13c) each extending axially through at least one of said rollers (12a, 12b, 12c, 12d) rotatably mounted thereon and each anchored at its opposite ends to a respective pair of support parts on

the associated sheet conveying guide (15). Therefore, since the features specifying the structure of the apparatus are correctly defined in relation to the effect which they are intended to provide in accordance with the patent in suit, Claim 1 is clear in the sense of Article 84 EPC.

4.3 Novelty of Claim 1

The novelty of Claim 1 has not been contested (Article 54 EPC).

4.4 Inventive step of Claim 1

- 4.4.1 An image recording apparatus is known from D1 (see page 5, line 25 to 32; page 6, line 24 to page 11, line 26; Figures 1 to 5); the apparatus has a lower body member (27), an upper body member (20) hingedly connected to the lower body member (27) for movement between a lowered, body closed position, and a raised body open position; the apparatus also comprises a sheet conveying device for conveying a sheet (2) along a sheet feed path in said apparatus, said sheet conveying device comprising first and second roller means (11B, 11A) constituting drive means for advancing the sheet and mounted respectively on said upper and lower body members (27, 20), said first and second roller means (11B, 11A) forming a nip for the sheet in said body closed position and being separated in said body open position, wherein one of said roller means (11B) is spring biased against the other (11A) in said body closed position for regulation of the pinch pressure applied to the sheet. However, contrary to the apparatus in dispute, the first and second roller means (11B, 11A) of the known apparatus are not mounted on respective sheet conveying guides (10; 8) which are provided on respective ones of said upper and lower body members and

which form said sheet feed path in said body closed position, but to the sidewalls of said respective bodies; moreover, said one (11B) of said roller means of the known apparatus indeed comprises a plurality of axially aligned rollers (11B), but said spring means (29) is not constituted by a plurality of aligned elongate coil springs each extending axially through at least one of said rollers rotatably mounted thereon and each anchored at its opposite ends to a respective pair of support parts on the associated sheet conveying guide. The Respondent has argued that, in the apparatus in dispute, the plurality of elongate axial coil springs on which the rollers are rotatably mounted provides the added advantage that the pressure applied to the sheets passing through the nip between the sheet feeding rollers can be regulated in a sense transverse to the sheet feeding direction, i.e, along the set of axially aligned rollers, whereby unequal wearing of the different rollers will not adversely affect the uniformity of the pinch pressure across the sheet, which can in due course lead to sheet skewing. Indeed, in accordance with the patent in suit (see column 3, line 34 to column 4, line 5), the rollers can rotate about the respective springs and are also displaceable by the action of the springs resulting from said spring mounting of the rollers. Therefore, a problem of the apparatus known from D1 can be seen in the rigid mounting structure of the rollers (11B) on the axis (26). The Appellant has submitted a sketch showing his interpretation of text locations of D2 (see page 1, line 10 to 18 and 40 to 54) mentioning a plurality of rollers and of springs. Indeed, an apparatus is known from D2 (see page 1, line 1 to 61; page 2, line 53 to 74; Figures 7 and 8), which is in the same technical field of counter pressure members for sheet feeding and like machines and which comprises a coil spring (6) on which a roller (1) is rotatably mounted, thereby

allowing movements of said roller (1) in directions perpendicular to and/or parallel with the axis of said coil spring (6); however, the embodiments shown by D2 (see for instance Figures 1 and 2) are provided with a plurality of rollers, but as pressure (1) and counter-pressure rollers (2), and with a plurality of springs (7), but relating to the same roller (1), and do not comprise any aligned arrangement of springs and rollers in the sense of the patent in suit. Moreover, in the apparatus known from D1 (see page 10, line 1 to 5), the rollers (11B) are rotated about the axis (26), which is derivable as being a rigid axis and, between the individual rollers (11B) on said axis, there are elements (30) which are arranged to hinder any movement of the individual rollers along said axis. Thus, the skilled person starting from D1 derives therefrom that a fixed mounting of the rollers on the axis is important and he can be discouraged to use any spring means allowing a movement of the individual rollers (11B) along their axis. Moreover, as convincingly argued by the Respondent, D1 (see page 9, line 28 to 37; Figures 4 and 5) teaches that the springs (29) have a double function which is to resiliently press together the rolls (11A, 11B) and, moreover, to maintain the axis (26) in the openings in the side walls of the bodies of the apparatus. Therefore, even if the skilled person were incited to take into account an enlarged roller pressing structure with a plurality of axially aligned rollers supported on a spindle as can be interpreted from D2, he would find no incitation for renouncing to the transversal springs (29) of D1 and would thus arrive at an apparatus different from the apparatus in dispute in that sense that the spring means would not be constituted by a plurality of axially aligned coil springs, but would also comprise transversal spring means acting on a spindle or axis. Concerning the apparatus of D4, the resilient beam (4) carrying the

roller means (1) does not solve the problem mentioned by the Respondent in that sense that no lateral movement of the rollers along the beam (4) is derivable.

- 4.4.2 During the appeal procedure, the Appellant has submitted the new prior art documents D8, D9, D10 and D11. In accordance with the conclusions of the Decision T 326/87, OJ EPO, 1992, 522, in particular point 2.1.2 and 2.2, it is necessary to consider for their admissibility whether their relevance is such that they could put the maintenance of the patent at risk.

D9 (see column 1, line 15 to 40; column 2, line 38 to 67; Figures 5 and 6) concerns an apparatus for centring a strip, in particular for a belt conveyor, wherein neither the conveying of paper sheets nor the regulating of a pressure applied to such a sheet between roller means is derivable. Therefore, although it shows a coil spring (28) supporting a pair of rotatable strip supporting members (30), D9 does not relate to paper sheet conveyors and is not relevant. D8 (see column 1, line 9 to 27; column 2, line 35 to column 3, line 6; Figures 2 and 3) indeed concerns a sheet guiding apparatus in a xerographic apparatus; however, the object of the known device is to provide an apparatus wherein a sheet of paper is held in a flat position while passing through parts of the apparatus without moreover smearing or obliterating the image formed on the paper sheet; this purpose is obtained by a thin circular disc cut with teeth or star-like points about its periphery and rotatably mounted on flexible wire brackets along the flow path of the paper sheet, whereby there is provided a guide or hold-down device that contacts the surface of the paper sheet by a series of small points and does not smear or remove the powder image from the surface of the sheet. However, as derivable from D8 (see the claims and column 5, line 32

to 39; Figures 2 and 3), the points of the disc shaped members are "immediately above the sheet material", for instance at a distance of about 1 mm (1/16 of an inch), so that rotation takes place "upon contact with the sheet material". Therefore, no indication is derivable from D8 that the thin circular discs cut with teeth or star-like points about their periphery and rotatably mounted on flexible wire brackets along the flow path of the paper sheet should apply a pressure or should regulate a pressure. Thus, D8 is relevant neither as a starting prior art document nor as a complementary prior art document in view of the problem to be solved by the apparatus in dispute.

An image recording apparatus is known from D10 (see in particular Figures 3(b), 4(a), 4(b) and 8; pages 18 and 19 of the English translation); the apparatus has a lower body member, an upper body member (39) hingedly connected to the lower body member for movement between a lowered, body closed position, and a raised body open position, and a sheet conveying device for conveying a sheet along a sheet feed path in said apparatus; said sheet conveying device comprises first and second roller means (41, 38) constituting drive means for advancing the sheet and mounted respectively on said upper and lower body members, said first and second roller means forming a nip for the sheet in said body closed position and being separated in said body open position, wherein one of said roller means (41) is spring biased against the other (38) in said body closed position; it is derivable that the spring arrangement serves the regulation of the pinch pressure applied to the sheet. Said first and second roller means (41, 38) are mounted on respective sheet conveying guides (39, 20) which are provided on respective ones of said upper and lower body members and which form said sheet feed path in said body closed position. Said one (41) of said roller means

comprises a plurality of rollers (41). However, contrary to the apparatus of Claim 1 in dispute, said spring means of the known apparatus is not constituted by a plurality of aligned spring means, but also comprises other spring means (43) because, according to page 19, sixth to twelfth line of the English translation, the guide (39) is stopped and resiliently located and held by the spring (43), which is not aligned with the springs (42), at such a position that the roller (41) abuts the roller (38). Indeed, the springs (42) are mentioned as being "roller springs"; however, the spring (34) for the cassette and the spring (43) for the conveyor guide (39) are mentioned in the translation (see page 18, line 11 and 16 and page 19, line 6 to 10, respectively; see also Figures 3(b) and 8) as a "cassette spring" and as a "guide spring", respectively, thereby indicating only a relation and not a shape; therefore, taking into account what is shown in Figures 3(b), 4(b) and 8 of D10 and in particular the dimensions of the springs (42) in different directions, it is derivable that, contrary to the apparatus in dispute, the springs (42) of the known apparatus are not coil springs, but flat, rectangular, blade-type springs. It is also to be noted that, since each roller (41) is supported by at least two springs (42), each located at a respective end of the axis (no reference numeral) of the corresponding roller (41), there is no spring (42) extending axially through at least one of said rollers, and there is no roller (41) rotatably mounted on a spring (42) along an axis thereof. In this respect, there is no indication derivable from D10 that the rollers should be hollow along their axis so that a spring can extend therethrough. It is also to be noted that, although in the known apparatus each of the elongate springs (42) is anchored at its opposite ends to a respective pair of support parts on the associated sheet conveying guide, these support parts are not all

aligned, as in the apparatus in dispute for making an aligned arrangement of both the springs and the rollers, but are arranged as pairs of support parts at both sides of the axis of the rollers. Therefore, contrary to the apparatus in dispute, wherein the line along which the springs and the rollers mounted thereon is structurally defined by the arrangement of the pairs of support parts, there is in the known apparatus no structural definition of an alignment of the rollers (41) as soon as the springs (42) are moved. Therefore, the skilled person starting from the apparatus of D10, without a structural alignment of the rollers, cannot consider that the apparatus of D2 (see page 1, line 1 to 61; page 2, line 53 to 74; Figures 7 and 8), which is indeed in the same technical field of counter pressure members for sheet feeding and like machines, but which comprises a structure wherein an alignment of the springs (6) and the rollers (1) rotatably mounted thereon can be defined structurally by the spindle (6), are compatible techniques which can be combined in an obvious way. Therefore, taking D10 into account does not change the conclusion concerning the inventive step. As admitted by the Appellant, the teaching of D11 is equivalent to that of D10.

Therefore, D8, D9, D10 and D11, which were submitted late, are disregarded pursuant to Article 114(2) EPC.

- 4.5 Thus, the subject-matter of Claim 1 according to the second auxiliary request involves an inventive step in the sense of Article 56 EPC and, therefore, the patent can be maintained in amended form (Articles 52(1) and 102(3) EPC).

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the Opposition Division with the order to maintain the patent in amended form on the basis of the following documents:

Claims 1 and 2 of the second auxiliary request presented at the oral proceedings of 21 September 1994;

description of the patent specification to be adapted;

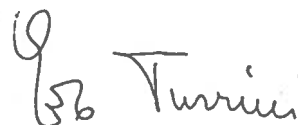
drawings of the patent specification as granted.

The Registrar:



P. Martorana

The Chairman:



E. Turrini

MCH
P. Sch.

