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Case Number: T 95 / 82

DECISION

of the Technical Board of Appeal 3.4.1

of 19 April 1983

Appellant: BRITISH GAS CORPORATION
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Representative: Walter Wallace
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Decision under appeal: Decision of Examining Division 061 of the European Patent Office dated 4 March 1982 refusing European patent application No 80 900 367.6 pursuant to Article 97(1) EPC

Composition of the Board:
Chairman: R. Kaiser
Member: O. Huber
Member: P. Ford

I. Summary of Facts and Submissions

(1) On 21 February 1980, the appellant filed International Application No. PCT/GB 80/00028, entitled "Improvements in or Relating to Pipe Inspection Apparatus", under the Patent Cooperation Treaty in Great Britain, claiming priority from an application for a British national patent, filed on 28 February 1979, and designating France for a European Patent. On 4 September 1980, the application was published (publication No. WO 80/01841).

European application No. 80 900 367.6 was refused by decision of the Examining Division 061 of the European Patent Office, dated 4 March 1982, on the basis of claims 1 - 3, filed on 21 December 1981. The grounds for refusal were that (a) claim 1 contained terms of an unascertainable scope ("means for constraining", "inspection assembly") and was therefore not clear (Article 84 EPC), (b) a pipe inspection apparatus according to claim 1 was disclosed in US-A-4 105 972 and is therefore not new (Article 52(1) EPC) and (c) the dependent claims 2 and 3 were not allowable due to lack of inventive step.

(2) On 29 April 1982, the appellant lodged an appeal against the decision, by telex. A document reproducing the contents of the telex was filed on 1 May 1982. The appeal fee was paid on 30 April 1982. The appellant submitted a Statement of Grounds on 26 June 1982.

In reply to two communications issued by the rapporteur pursuant to Article 110(2) EPC, the appellant filed a new sngle claim, a new description and two amended

sheets 1/3 and 3/3 of drawings (Fig. 1 and Fig. 3) on 6 April 1983. The originally filed and published sheet 2/3 of drawings (Fig. 2) is still effective.

The present claim, the characterising portion of which was divided by the Board in parts (a) to (d), reads as follows:

An internal pipe inspection apparatus for examining the pipe wall for flaws or defects comprising a vehicle (10), means (14) for aligning the vehicle lengthwise along the bore of the pipe, an inspection assembly having a carrier (21) supporting a plurality of resiliently mounted and radially outwardly biased inspection devices (22), the carrier (21) being movable relative to the axis of the vehicle such that it will centralise itself within the pipe and being freely supported for said relative movement by suspension means, characterised in that (a) the suspension means comprises at least four link members (20) and a plurality of resilient members (24), (b) said link and resilient members (20,24) being disposed in equispaced relationship around the vehicle (10), (c) each link member (20) being pivotally connected by universally pivotable connecting means (19, 20a,23) to the vehicle (10) at one end of the link member and to one side of the carrier (21) at the other end of said link member, and each resilient member (24) being connected at one end thereof to the vehicle (10) and at its other end to the other side of the carrier (21), and (d) in that each inspection device (22) comprises a pair of ultrasonic wheel probes (29,30) each mounted for rotation about a spindle (35) carried by a common support member (36) which is itself pivotally (37) mounted at the free end of a spring loaded arm (38)

the other end of which is pivotally (41) mounted on the carrier (21) so as to pivot in a radial plane with respect to the vehicle.

(3) The appellant has requested that the decision of the Examining Division be cancelled, the present application be allowed on the basis of the documents mentioned above and the appeal fee be refunded.

II. Reasons for the Decision

(1) The appeal complies with Articles 106 to 108 and Rule 64 EPC. It is therefore admissible.

(2) There is no formal objection to the current claim, since it is adequately supported by the original documents.

(3) The preamble of the claim is based on the prior art as disclosed in US-A-4 105 972. In this document a (magnetic) internal pipe inspection apparatus for examining a pipe wall for flaws is described which comprises a vehicle (1), means for aligning the vehicle lengthwise along the bore of the pipe (in the form of spring-loaded magnet segments (2) having pole pieces (3)) and an inspection assembly having a carrier (flanged ring (6)) supporting a plurality of resiliently mounted and radially outwardly biased (springs (19,22)) inspection devices (detector modules (5)). The carrier (6) is movable relative to the axis of the vehicle (1) such that it will centralise itself within the pipe and it is freely supported for said relative movement by suspension means. The latter consists of posts (27) secured to the magnet segments (2) and freely engaged by elongated slots (28) formed in the flanged ring (6).

Therefore the features (a), (b) and (c) do not exist. So far as feature (d) is concerned, US-A-4 105 972 discloses only a plurality of spring loaded arms (Figs. 2 and 4: 16, 19, 22) the ends of which are pivotally (rubber strip (18)) mounted on the carrier (6). The other free ends of the arms (16) each carry an inspection device (5), here in the form of a detector module for the leakage field and not of a support member of a spindle of an ultrasonic wheel probe. Furthermore, the arms (16) are linked to the carrier (6) in such a way that they are pivotable in a plane through the axis of the vehicle and not in a radial plane with respect to the vehicle.

The subject-matter of DE-A-1 932 462 is a magnetic inspection apparatus for flaws in pipe walls. The apparatus contains an elastic front sealing member (13), a front instrument box (16), a H-like magnetic yoke (26,28,29), a back instrument box (17) and a back sealing member (14). All these elements are connected in series by means of one pivotable link between each two elements. Detector coils (36,37) are pivotally mounted at the free ends of arms (without reference number), the other ends of which are pivotally mounted on
an annular carrier (without reference number) fastened to the magnetic pole piece (28) by suspension means (several posts without reference number). Even if the H-yoke (26,28,29) is interpreted as a vehicle, an essential feature according to the first part of the claim is missing, namely that the carrier is movable relative to the axis of the vehicle. Consequently, the characterising features (a), (b) and (c) are not present. As for the characterising feature (d), DE-A-1 932 462 discloses only a plurality of swinging arms

carrying the detector coils (36,37). In contrast to the subject-matter of the application, the swinging movement of the arms takes place in a plane containing the axis of the vehicle (magnetic yoke).

In the pipe inspection device according to FR-A2 320 542 which operates on the basis of eddy currents the "vehicle" consists of a helical spring (10 in Fig. 1) or a series of bellows (31,32,33 in Fig. 2) on which are mounted means for aligning (guide blocks (7), (9) in Fig. 1, carriages (40), (42), (9a) in Fig. 2) the "vehicle" along the bore of the pipe (5) and an inspection coil system (1 in Fig. 1, 1a in Fig. 2). An element comparable with the carrier of the subject-matter of the application does not exist. Therefore, the corresponding features of the preamble and the characterising features (a), (b) and (c) are missing. The same is true for feature (d).

Thus, the subject-matter of the claim is novel.

(4) The question now to be examined is whether the subject-matter of the claim involves an inventive step.

(4.1) According to page 3, first paragraph, of the description, the present invention has for its object to provide an improved internal pipe inspection apparatus which will cater for bends in the pipe line, and, in some cases, will accommodate changes in the diameter of the pipe line, without upsetting to an unacceptable degree the alignment, positioning and degree of contact of the ultrasonic wheel probes in the bore of the pipe line. These problems are already mentioned in the original and published description, see page 2, second paragraph. The

devices described in US-A-4 105 972 and FR-A-2 320 542 already serve the purpose of the first part of the problem, see in the US document, column 3, lines 38-46, and in the FR document, page 2, lines 11-23. Furthermore, it is well known in testing material by ultrasonics that an intimate contact is required at all times between the ultrasonic transducer and the test piece (second part of the problem). Therefore, the aims set by the present application cannot be regarded as inventive.

(4.2) The first part of the problem is mainly solved by the features (a), (b) and (c). Thus, the claimed universally pivotable connections permit the necessary radial movement of the inspection assembly (21,22) relative to the vehicle axis. In addition, a canting or tilting movement of the inspecton assembly (21,22) is feasible, which is particularly important when the apparatus is entering or leaving a bent section of a tested pipe. The resilient members (24) press the inspection assembly (21,22) in the neutral position between the aligning mains (14).

There is no suggestion in the state of the art how a design engineer in the field of material testing equipment, starting from the post-elongated slot-system according to US-A-4 105 972 which permits only a radial and azimuthal movement of the carrier (6), might arrive at the particular solution according to features (a), (b) and (c) of the claim. These features do not result from a simple alteration of the means effecting the mobility of the carrier (6) in US-A4 105 972, on the basis of a replacement by equivalent mechanical elements. Nor does the state of the art disclosed in

DE-A-1 932 462 provide any hint of the claimed coupling means between the vehicle (10) and the inspection assembly (21,22) since the (annular) carrier is fastened to the vehicle (pole piece (28)).

Finally, FR-A-2 320 542 must be disregarded, since there is no carrier.

Under these circumstances, the special design of the connection means between the vehicle (10) and the inspection assembly (21,22) according to features (a), (b) and (c) is based on an inventive step.

Feature (d) particularly solves the second part of the problem.

Feature (d) provides a special mounting of a pair of ultrasonic wheel probes which is not disclosed in the prior art. The Board has no hesitation in adding feature (d) to the first group of features (a), (b) and (c), since the achievement of the necessary intimate contact between the pair of wheel probes and the inner pipe wall is also supported by the multi-dimensional mobility of the inspection assembly (21,22) accomplished by features (a), (b) and (c) and, vice versa, the resilient mounting of the pairs of ultrasonic wheel probes according to feature (d) facilitates the movement of the claimed aparatus along a bent section of the pipe (first part of the problem).

In summary, taking into account the devices of the prior art individually or in combination, including the general knowledge of the person skilled in the art, does

not make the solution according to the invention obvious.

Therefore, the internal pipe inspection apparatus in the claim involves an inventive step (Article 56 EPC).

(4.3) The claim is thus allowable in accordance with Article 52(1) EPC.

(5) The effective description meets the requirements of Rule 27 EPC.

(6) The second sentence of Article 84 EPC stipulates that the claim must be clear. The version of claim 1 effective at the time of refusal of the application did not meet this requirement, since a skilled man could not have any idea how to realize the only essential feature of claim 1 in the form of "constraining means" in order to examine a circumferential band of a pipe wall which band lies in a plane normal to the longitudinal axis of the pipe (and not of the vehicle). This deficiency was already stated in the communication of the Examining Division dated 3 September 1981 and was not remedied by the appellant. Consequently, the refusal of the application was justified. Therefore, the request for reimbursement of the appeal fee pursuant to Rule 67 EPC cannot be granted, since there is no substantial procedural violation.

III. Order

For these reasons it is decided that:

(1) The decision of Examining Division 061 of the European

Patent Office dated 4 March 1982 is set aside.

(2) The case is remitted to the first instance, with the order to grant a European patent on the basis of the following documents:

Description, claim and two sheets of drawings 1/3 and 3/3 (Fig. 1 and Fig. 3) received on 6 April 1983, one sheet of drawings 2/3 (Fig. 2) as published.

(3) The request for reimbursement of the appeal fee pursuant to Rule 67 EPC is refused.

The Registrar: The Chairman:

J. Rückerl R. Kaiser