

COMMISSIONER'S DECISION

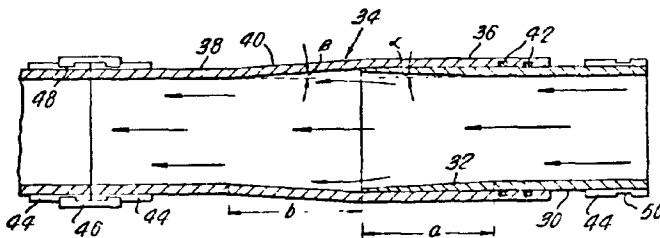
OBVIOUSNESS - Pipe Line Expansion Joint

This application claims a new pipeline expansion joint having a smooth bore. The cited art, which showed fixed joints, did not teach nor suggest the advance made in the art by the present application.

Final Action: Reversed

This decision deals with a request for review by the Commissioner of Patents of the Examiner's Final Action dated December 4, 1975, on application 173,572, Class 285-29. The application was filed on June 8, 1973, and is entitled "Pipeline Expansion Joint Having A Smooth Bore." The Patent Appeal Board conducted a Hearing on June 22, 1977, at which Mr. R. Lafleur represented the applicant. Also in attendance was the inventor, Mr. D.W. Bennett.

This application relates to a pipeline expansion joint having a smooth bore, more particularly a smooth bore for use with slurries containing solids in liquid suspension. Figure 3, shown below, is illustrative of that arrangement:



In the Final Action the examiner refused the application for failure to define any patentable improvement over the following references:

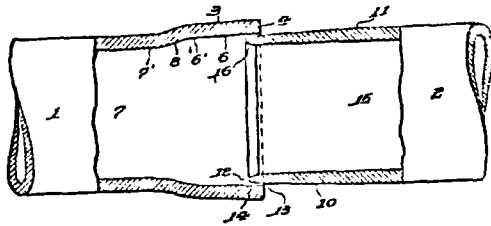
Canadian Patent

301,308	June 17, 1930	Siegle
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United States Patent

3,090,437	May 21, 1963	Geer
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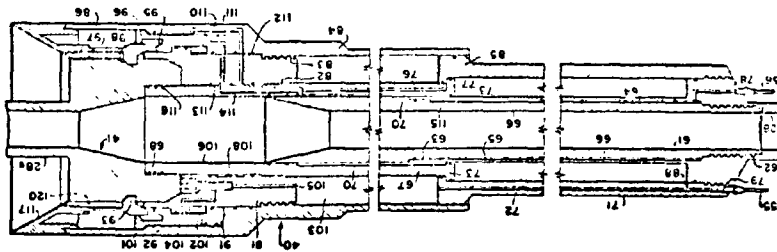
Siegle relates to pipe joints and more particularly to joints suitable for uniting steel pipe sections in pipe lines for conveying oil and gas and which therefore must be of such character as to prevent leakage of the contents of the line. Figure 1, shown below, illustrates that invention:



Claim 1 of Siegle reads as follows:

In a pipe joint, the combination of a pipe section having an integral bell at one end providing a tapered conical surface extending inwardly from its outer face and a gradually curved surface extending from the inner end of the tapered surface to the cylindrical bore of the pipe, a second section having a conical inwardly tapered zone on its outer surface spaced from one end of the section and corresponding in taper to the conical surface of the bell and a zone between the end of the tapered zone and the end of the section curved in correspondence with the curved surface of the bell, said tapered and curved zones of the second pipe section being disposed in intimate contact with the corresponding surfaces of the bell, and welding material disposed by autogenous welding in the angle formed between the outer face of the bell and the peripheral surface of the second section and serving to unite the sections.

Geer is concerned with an underwater wellhead flow line connector. Figure 4, shown below, is illustrative of that arrangement:



In that action he presented his position (in part) as follows:

The two cited patents clearly show that it is well-known in the pipeline art to provide tapered end sections of pipes on pipe joints to reduce turbulence and friction losses. It is considered to be obvious and mere expected skill of one working in the art to provide the required amount of taper for each different application of such pipe joints.

In his letter of October 6, 1975 applicant argues that "As now recited in independent claim 1, these two small angles are small, extend over a substantial portion of the lengths of the respective sleeves, and are substantially equal." Examiner maintains, as set forth in the previous Office action that it is obvious for one skilled in the art to provide the required amount of taper for each different application of such pipe joint, i.e. all parameters will be taken into consideration; diameters of the pipelines, type of fluid to be carried, pressures, volume of flow etc....

Applicant also argues that the pipelines of the cited patents do not carry slurries containing solids in suspension. Examiner restates that the type of fluid to be carried is an important factor in the design of pipelines and that this factor is normally taken into consideration when designing a pipeline. In a case where a pipeline does carry an abrasive fluid, it is common knowledge of one working in the art to provide as smooth an interior passage as possible which would indicate small angles of taper in a telescoping joint if such a joint was required in the pipeline.

The applicant in his response presented his views (in part) as follows:

Canadian Patent 301,308 discloses a fixed joint with no moving parts and thus is not an expansion joint as disclosed and claimed in the present application. This joint is for use in pipelines conveying oils and gas and the main problems to be solved by the joint are to prevent leakage of the content of the line and corrosion due to sulphur and other constituents of the fluids passing through the line. Nowhere in the patent is there any teaching or suggestion that the joint could be used in pipes conveying solids in suspension. Thus, this patent is not concerned at all with applicant's problem, i.e. excessive wear of the joint caused by turbulence in the pipes of the solid materials in the slurry which act as grinding stones to rapidly puncture the joint. Therefore, the patentee of Canadian Patent 301,308, was never confronted with the problem faced by the applicant and, of course does not teach or suggest any solution to applicant's problem. Furthermore, upon reading the disclosure of the patent, it is soon realized that the critical tapered surfaces of the patent are tapered surfaces 6 and 10 which have to meet closely so as to form a tight joint. These tapered surfaces cannot be compared to the critical tapered surfaces of applicant's invention. The profiled portion 8 of the pipe section 1

of the patent and the chamfered portion 16 in the pipe section 2, which in fact correspond to the critical tapered portions of applicant's invention are not tapered portions in the common sense of the word but rather profiled portions....

...

Concerning the Examiner's rejection on obviousness, applicant would also like to point out that if it was so obvious to solve the problem as the applicant has done it, why no expansion joint as disclosed by the applicant has ever been put on the market over the period of forth-five years since the issue of the above patent. Solids in suspension have been carried in pipelines for a long period of time and, as far as it is known to the applicant, no one has ever marketed an expansion joint such as designed by the applicant and claimed in the present application. It is to be noted that the applicant, Grandview Industries Limited, has been in the business of making pipes for a good number of years. If the invention had been so obvious, it or some other organisation would have marketed an expansion joint such as disclosed and claimed in the present application a long time ago. As far as it is known to the applicant, rubber hoses have been used as expansion joints in pipes conveying solids in suspension.

...

The critical issue to be answered by the Commissioner can thus be simply phrased. Is there any teaching in the patents of record which would suggest to the man having ordinary skill in the art how to solve the erosion problem occurring in expansion joints used in pipes conveying solids in suspension? As already discussed above, this question, in our view, must be answered in the negative since there is no teaching nor suggestion in the prior art which would even hint at the solution proposed by the applicant. The prior art cited by the Examiner deals with problems which are remote from the erosion problem faced by the applicant. Thus these patents would generally be of no help to a man of ordinary skill in the art in solving his erosion problem. The erosion problem could have been caused by the accumulation of solid materials in the joint and the deviation of the normal flow of the liquid in the pipe which would cause friction and erosion of the pipe. An obvious solution to this problem would be to increase the thickness of the sleeves of the expansion joint. Even assuming *arguendo* that the man skilled in the art would have realized that the rapid wear of the pipe resulted from turbulence in the pipe at the location where abrupt changes in diameter exist and that consequently all sharp corners should be avoided, it should be noted that the mere elimination of sharp corners does not equate to the expansion joint disclosed and claimed in the present application....

We have carefully considered the prosecution of this application and the interesting and informative remarks made at the Hearing by Messrs. Lafleur

and Bennett. The issue before the Board is to consider whether the application is directed to a patentable advance in the art. Claim 1 of this application reads as follows:

A pipeline expansion joint having a smooth bore for use with pipelines into which flow slurries containing solids in suspension comprising:

- a) a first sleeve open at both ends and having a tapered portion formed in the inner wall of one of its ends extending at a small angle with the axis of the first sleeve and over a substantial portion of its length from its inside diameter to substantially its outside diameter; and
- b) A second sleeve also open at both ends and having a first portion of substantially the same inner diameter as the outer diameter of said first sleeve and telescopically mounted on said one end of the first sleeve, a second portion of substantially the same inside diameter as that of said first sleeve, and an intermediate portion expanded at a small angle with the axis of the second sleeve over a substantial portion of its length from said second portion to said first portion of the second sleeve, and wherein the small angle of taper in said first sleeve is substantially the same as the small angle of expansion in said second sleeve, thereby providing a smooth bore throughout the expansion joint with no area of abrupt changes in order to prevent turbulence and the resulting wear of the expansion joint by the solids in suspension in the slurries.

The difficulty "of how to solve the erosion problem occurring in expansion joints used in pipes conveying solids in suspension," was clearly explained at the Hearing. The key words may well be in expansion joints.... The object is to avoid turbulences in the pipes which cause erosion at the joints while being used for carrying solids in suspension. It is of course essential that the inside diameter varies to some extent where the two pipe sections overlap, but this variance must be accomplished with a minimum amount of turbulence as the joint expands or contracts. This, according to the applicant, is where the advance in the art was accomplished.

On a close study of the Siegle patent we find that he was concerned with a fixed joint with no moving parts and thus is not an expansion joint. Siegle was also concerned with a different problem, that of leakage in a joint in pipe lines for conveying oils and gas. There was no consideration

of the joint being an expansive joint, nor was there any consideration of an excessive wear of the joint caused by turbulence while carrying an abrasive fluid. Siegle was not confronted with the problem facing the applicant, nor, in our view, does he teach or suggest any solution which might be helpful to the present applicant.

Geer relates to a pipeline coupling for use in pipes conveying oil. The coupling is not used in pipes conveying solids in suspension, and consequently the problem of erosion from abrasive fluids is not present and it naturally follows that no solution was given. It is clearly seen that the coupling does not show two telescopically mounted sleeves. Both of the cited references deal with problems which are remote from the erosion problem faced by the applicant.

At first blush the cited patents may appear pertinent. At the time of the Final Action however, the examiner did not have the advantage of the arguments and explanations that were succinctly brought out at the Hearing. We also find no reason to disagree with the points covered in the affidavit from the inventor, Mr. Bennett, which was submitted to the Board after the Hearing. These points centered around the allegation that no existing expansion joints presently on the market are suitable for the specific purpose of preventing erosion in expansion joints as outlined by the applicant.

In summary we are satisfied that the applicant has made a patentable advance in the art and we recommend that the decision in the Final Action to refuse the application be withdrawn. In reviewing the claims however, we find that claim 1 should more distinctly define the advance in the art and be amended to bring out the feature that the first sleeve of the expansion joint is telescopically mounted "in continuous sliding contact" with the second sleeve (see line 12 of claim 1).



J. F. Hughes
Assistant Chairman
Patent Appeal Board, Canada

I have studied the prosecution of this application and reviewed the recommendation of the Patent Appeal Board. In the circumstances I withdraw the Final Action and will accept the claims when amended as suggested by the Board.

A handwritten signature in black ink, appearing to read 'J.H.A. Gariépy', written in a cursive style.

J.H.A. Gariépy
Commissioner of Patents

Dated in Hull, Quebec

this 8th. day of August, 1977

Agent for Applicant

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