

Jan. 11, 1966

D. A. HAUSMANN ET AL
PIPE JOINT AND BAND THEREFOR

3,228,712

Filed March 19, 1962

2 Sheets-Sheet 2

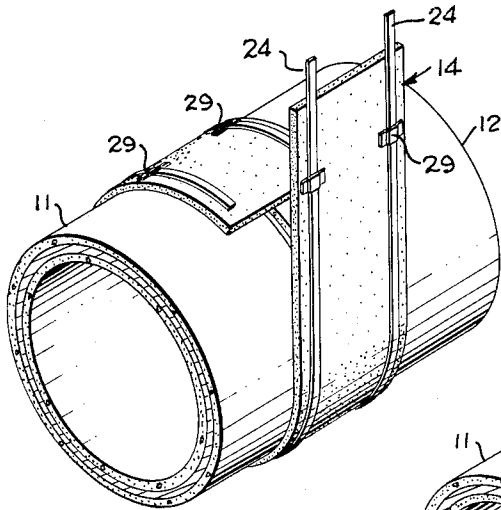


Fig. 3

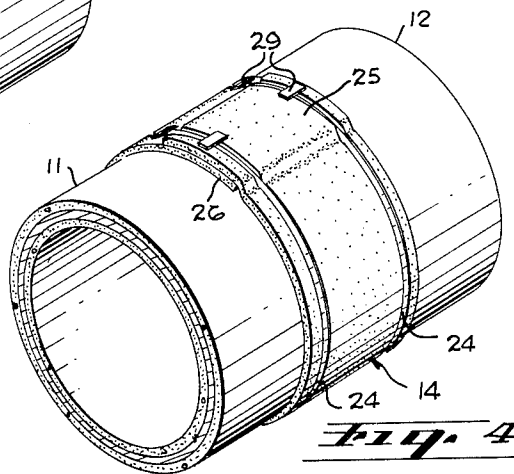


Fig. 4

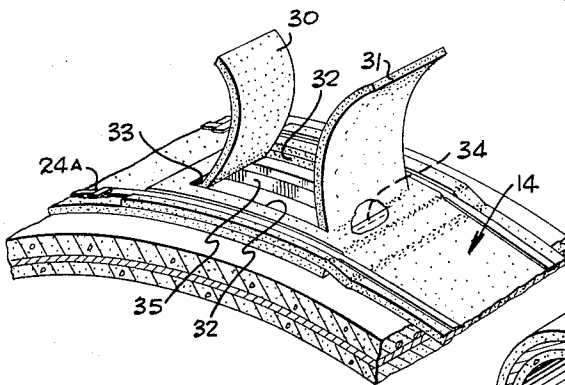


Fig. 5

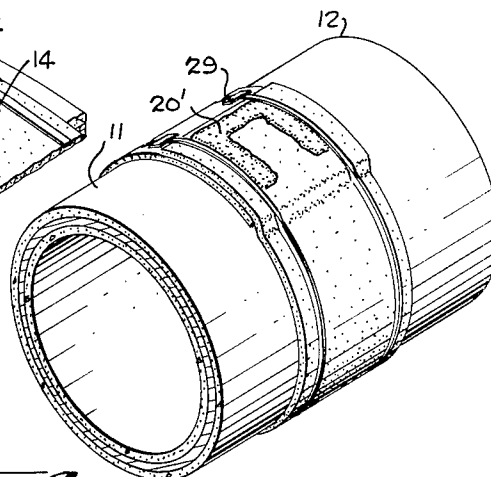


Fig. 6

INVENTORS
DELBERT A. HAUSMAN
ARTHUR G. LANDER
BY

Mason & Shabram
ATTORNEYS

1

2

3,228,712

PIPE JOINT AND BAND THEREFOR

Delbert A. Hausmann, Glendale, and Arthur G. Lander, Lynwood, Calif., assignors to American Pipe and Construction Co., Los Angeles, Calif., a corporation of Delaware

Filed Mar. 19, 1962, Ser. No. 180,748

2 Claims. (Cl. 285-45)

This invention has to do with the making of joints in the field in the installation of concrete pipe having steel joint elements.

In laying concrete pipe having interfitting steel joint elements embedded in the concrete pipe wall it is the usual practice to fill the annular space between the adjacent ends of pipe sections radially outward of the steel joint elements with a cement mortar grout to complete the joint. To accomplish this a temporary mold in the form of a band of heavy cloth or asphalt-impregnated paper is placed around the joint and secured with metal straps. The grout is then poured through an opening in the top of the band and allowed to harden before the pipe is buried.

Cracks subsequently frequently develop in the grout thereby exposing the underlying steel elements of the pipe to corrosive soil fluids which seep through the permeable cloth bands or between the asphalt bands and the outer surface of the pipe. Also, both types of bands disintegrate in time exposing the mortar.

An object of the present invention is to overcome the above-noted disadvantages of ordinary bands by providing a novel band for use in the making of such joints between concrete pipe sections which serves both as a mold for retaining the fluid mortar until it hardens and subsequently as a permanent barrier against penetration of moisture in the soil which might otherwise gain entrance to corrode the steel elements of the pipe through cracks which may eventually develop in the mortar.

Another object is to provide a band which is flexible and will yield and conform to any relative movement between adjoining pipe sections and a band of sufficient resiliency and thickness to tolerate impact, abrasion and considerable abuse without serious damage.

A further object is to provide such a band which is chemically unaffected by the cement grout and by any chemicals likely to be encountered in a corrosive soil environment.

Another object is to provide a novel joint construction for concrete pipe sections and a novel method of making such a joint.

The above and other objects will be apparent from the drawings and the following description. Referring to the drawings;

FIG. 1 is an elevational view of adjacent end portions of two pipe sections and the joint therebetween;

FIG. 2 is a fragmentary sectional view through a completed joint, but on a larger scale;

FIG. 3 is a fragmentary isometric view of two pipe sections at the joint area showing the step of attaching a mold band thereto;

FIG. 4 is a view similar to FIG. 3 but showing the mold band in place;

FIG. 5 is a fragmentary view similar to FIG. 3 but on a larger scale, showing the band prepared for receiving the cement mortar;

FIG. 6 is an isometric view of the completed structure; and

FIG. 7 is a greatly enlarged fragmentary cross sectional view through a portion of the band, showing the ruptured cell structure on the inside of the band.

More particularly describing the invention, in FIG. 1,

two joined pipe sections 11 and 12 are shown with the joint area 13 therebetween covered by a band 14 embodying the invention.

The invention is concerned with an improved joint for concrete pipe of the type having interfitting steel joint elements and particularly with the completion of the joint in the field. Referring now to FIG. 2, the pipe section 12 is shown as having a steel bell 15 for receiving a steel spigot 16 of the other pipe section. A gasket 18 of rubber, plastics or the like is provided between the two in a groove 19. In FIG. 2, which shows a completed joint, numeral 20 designates the annular body of cement mortar filling the annular space or groove which would otherwise exist between the ends 11A and 11B of the pipe sections radially outward of the spigot 16. The body 20 is encased by the band 14 of the invention which originally serves as a mold for the fluid mortar or grout.

In making joints in the field the pipe sections are brought together in end-to-end relation and the spigot 16 of one section inserted into the bell 15 of the other. We then provide the band 14 which is wrapped around the ends of the pipe sections, overlapping these, and secured in place by metal straps 24. Preferably the band is long enough to provide overlapping end portions 25 and 26.

The band itself is formed of a foam plastics, such as closed-cell polyethylene foam, which has been fabricated to provide a cellular body which is impervious to moisture. In making the band, a body of the plastics is sawn or cut along a given plane to rupture or cut the hollow cells along such plane and thereby provide an irregular, ruptured, or open-cell structure along the resulting surface, designated 28 in FIG. 7, which is used as the inner surface of the band. This enables the cement mortar or grout to fill the ruptured cells when it is poured and thus develop a mechanical bond with the material of the band after the mortar hardens, as will later become apparent.

As shown in FIGS. 3 and 4 the mold band is secured about the ends of the pipe sections by metal straps 24 and suitable fasteners 24A in a manner well known in the packaging art. The straps are preassembled with the band and may be loosely attached thereto by means of loops 29 provided on the band. After the band has been secured in place it is then cut in the overlapping area to provide two end flaps, 30 and 31, as shown in FIG. 5. This is accomplished by making two longitudinal cuts 32 completely through the end portions 25 and 26 and by making a cut 33 through the outer or overlapping section and a cut 34 through the underlying section.

The flaps 30 and 31 are then separated and held apart as shown in FIG. 5 in any suitable manner and the cement grout poured through the opening 35 to fill the annular space which then exists between the ends 11A and 11B of the pipe sections and which is circumscribed by the band itself. After the entire space has been filled the flaps are closed and some excess material 20' is provided in the region of the flaps to securely close the opening. Under the weight and pressure of the mortar the band will bow out somewhat, particularly in the lower portions.

As previously indicated the open or broken cell construction on the inner surface 28 of the band 14 allows the cement mortar grout to enter the ruptured cells and form a mechanical bond with the band as the mortar hardens and cures. In addition the grout permanently bonds to the external concrete surfaces of the adjoining pipe sections. Thus the band 14 is permanently mechanically bonded along both sides of the central joint area as well as over this area and becomes independent of the straps 24 which may ultimately fail.

Although we have shown and described a preferred

form of our invention, we contemplate that various changes and modifications can be made therein without departing from the invention, the scope of which is indicated by the claims which follow. By way of example, although the invention has been described as embodying a band 14 of a foam plastics, we contemplate that a closed cell type of foam rubber, either natural or synthetic, might be used. Also, a non-cellular type of rubber or plastics might be used provided the inner surface were roughened sufficiently that a mechanical bond could be achieved between it and the mortar.

We claim:

1. A pipe joint construction, comprising a pair of concrete pipe sections disposed in end-to-end relation and having interfitting tubular metal end portions disposed radially inward of their peripheries, the adjacent concrete end portions of said sections radially outward of the interfitting sections defining a circumferential groove, a body of concrete mortar filling said groove and extending radially beyond the groove and overlying the adjacent peripheral portions of the pipes, and an outer moisture-impervious band bridging said groove and receiving and covering said mortar, said band being formed of an impervious, flexible, closed cell, foam plastic-like substance having a broken cell structure on its inner surface, said

cells receiving said mortar whereby the band is mechanically bonded thereto.

2. The pipe joint construction set forth in claim 1 in which said band extends axially of the pipe joint beyond said mortar body and in which straps encircle the end portions of the band securing the same tightly against the peripheral portions of the pipe sections, respectively.

References Cited by the Examiner

UNITED STATES PATENTS

259,764	6/1882	Japtok	285—284
985,182	2/1911	Lang	285—284
1,001,682	8/1911	Pratt	285—294
1,238,383	8/1917	Blumenthal	285—293
1,840,447	1/1932	Halstead	264—269
2,055,885	9/1936	Weston	264—31
2,158,086	5/1939	Robert et al.	264—246
2,576,012	11/1951	Gurck	285—288
2,964,424	12/1960	Mast	117—138.8
3,100,658	8/1963	Miller et al.	285—230

CARL W. TOMLIN, *Primary Examiner.*

D. W. AROLA, *Assistant Examiner.*