★★★ ＜第 23 回知的財産翻訳検定試験【第 11 回英文和訳】＞ ★★★
≪１級課題 -電気・電子工学-≫

【解答にあたっての注意】
１．問題の指示により和訳してください。
２．解答語数に特に制限はありません。適切な箇所で改行してください。
３．課題文に段落番号がある場合、これを訳文に記載してください。
４．課題は３題あります。それぞれの課題の指示に従い、３題すべて解答してください。

問１）　次の英文は、穿孔用ロボットの発明の「従来技術」に関する説明です。日本語に訳してください。

For many years now, technologies have been developed and used to rehabilitate damaged water and sewage conduits. The various technologies basically consist of re-lining the inside walls of existing underground conduits to rehabilitate the underground conduits.

The service entrances of the existing conduit are initially plugged with a water plug carrying a position marker with a plug setting robot controlled by an operator looking through a video camera connected to the plug setting robot. Thereafter the existing conduit is re-lined internally with a flexible tubular liner impregnated with a curable resin which is cured in place with recirculating heated water after insertion in the underground conduit. Once the resin is cured and the re-lining of the existing conduit is done, the water plug can be located with a detection and drilling robot using the position marker of the water plug. Once the center of the water plug is located, the water plug is drilled out using a drill mounted on the robot which is operated by the operator.

The drill mounted on the robot typically consists of a main housing attached to the front portion of the robot that includes a power unit and an actuator for controlling a drilling head positioned at the front of the main housing. The drilling head includes a drill bit extending perpendicular to the

drilling head and to the longitudinal axis of the underground conduit.

問２）　次の英文は、３Ｄプリンタに関連する技術に関する実施例の説明です。一対の符号(Ａ)、（Ｂ）、及び（Ｃ）で囲まれた部分を日本語に訳して下さい。

This embodiment relates to a system for surface finishing of rapid-manufactured three-dimensional (3D) objects by vapor smoothing.

(A)

3D objects built by rapid manufacturing techniques generally exhibit "stair-step" appearances, particularly at curved or angled exterior surfaces. The stair stepping effect is caused by the layering of cross-sectional shapes that have square-edge profiles, and is more pronounced as layer thicknesses increase. While the stair stepping effect generally does not affect the strengths of the 3D objects, it may significantly diminish the desired aesthetic qualities.

(A)

FIG. 1 is a perspective view of a vapor smoothing surface finishing system 10 according to an embodiment of the present invention. FIG. 2 is a front view thereof.

Vapor chamber 18 includes bottom heater 26 and side heaters 28 and 29.

(B)

Primary cooling coils 30 are connected to refrigeration compressor 22, and are located near the top of vapor chamber 18 to create a vapor ceiling for containing vapor in vapor chamber 18. In order to operate vapor chamber 18 for vapor smoothing an object, solvent 32 is provided at the bottom of vapor chamber 18. Solvent 32 has a fluid level that is lower than the elevation of plate 34, so that any object that may be inadvertently dropped inside vapor chamber 18 does not fall into solvent 32.

(B)

Heaters 26, 28 and 29 are operated to form a vapor from solvent 32 in vapor chamber 18, which fills vapor chamber 18 below the vapor ceiling formed by primary cooling coils 30.

Drying chamber 20 is located within cabinet housing interior 16 adjacent to vapor chamber 18.

(C)

Drying chamber 20 is provided to allow an object that has been exposed to vapor in vapor chamber 18 to outgas for a period of time until the object is ready for either another exposure in vapor chamber 18 or removal from system 10.

In operation, sliding door 14 and sliding door 21 are opened to suspend an object in vapor chamber 18 in order to be smoothed at its surface by exposure to the vapor therein.

After the object has been exposed in vapor chamber 18, the object is raised out of vapor chamber 18 and moved to drying chamber 20. When the object is removed from vapor chamber 18, it is preferable to cover vapor chamber with sliding door 21, as a precaution to ensure that no further vapors escape vapor chamber 18. The object may be suspended in drying chamber 20 for as long as is necessary to dry and re-harden the surface of the object.

(C)

Secondary cooling coils 36 are provided near the top of cabinet housing 12 to cool drying chamber to a desired temperature, and to ensure that all vapors are contained within cabinet housing 12.

The processes of exposing an object in vapor chamber 18 and in drying chamber 20 may be repeated as many times as desired, to obtain a desired surface finish of the object. When the vapor smoothing process is complete, the "stair-step" features that are typically present in rapid manufactured objects will be significantly reduced or eliminated.

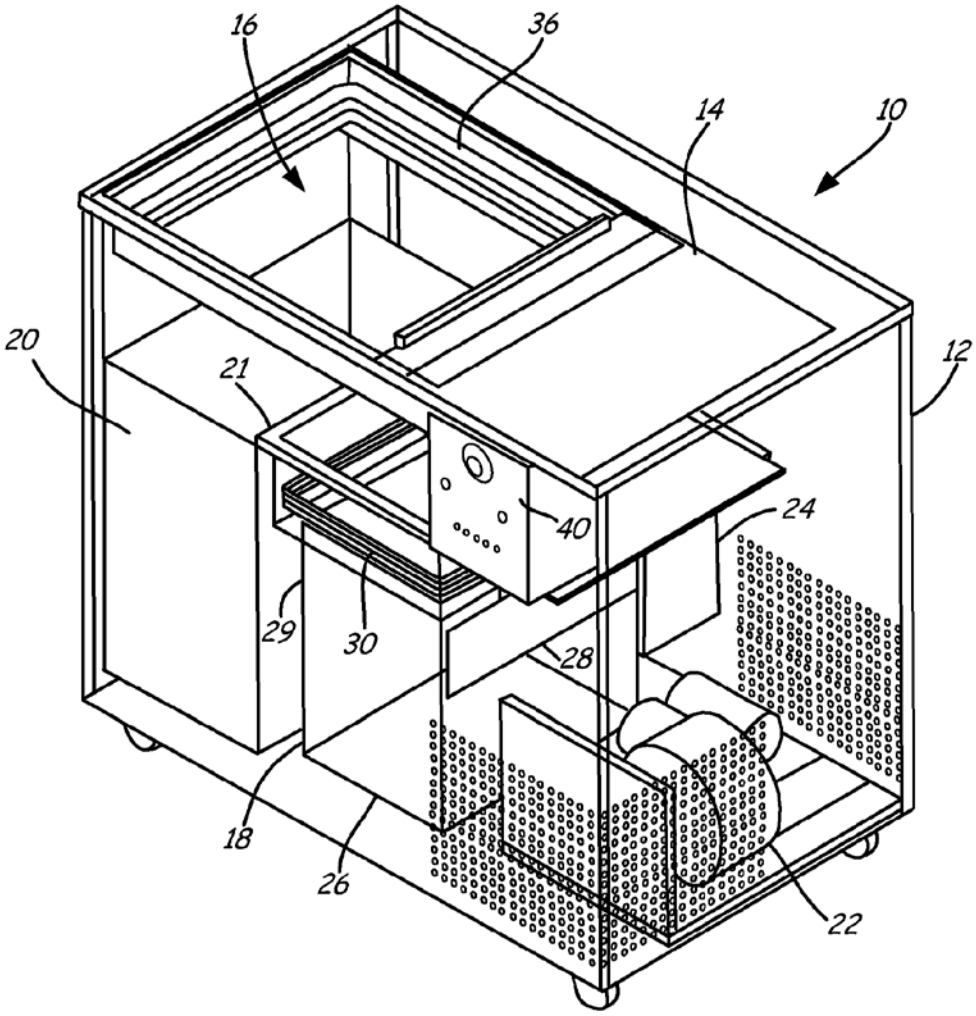

FIG. 1

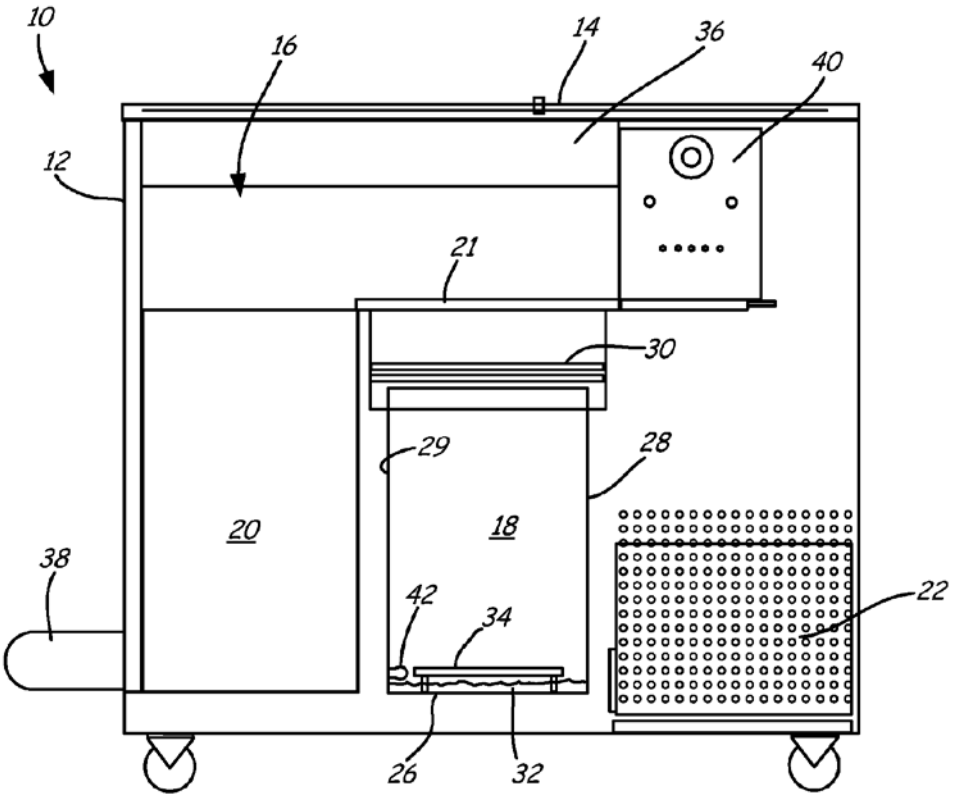

FIG. 2

問３）　次のクレームは、いわゆる人工知能（ＡＩ）技術を用いた文字認識技術に関するものです。クレーム部分を日本語に訳して下さい。クレームはその字句通りに訳していただいて結構ですが、必要に応じて、以下の実施例、及び図１～図２の記載を参照してください。なお、以下の実施例は、クレーム記載の事項の全てをサポートしたものではなく、その概要を示したものです。

1. A method for classifying a machine printed text and a handwritten text in an input, comprising:

defining a perspective for an auto-encoder, wherein the perspective comprises an inpainting perspective, wherein the inpainting perspective is a function of a hidden representation of the input and a reconstruction of the input, wherein the

hidden representation is based on an encoding function comprising a first non-linear function of an encoding layer weight of the input and an encoding layer bias thereof, wherein the reconstruction of the input is based on a decoding function comprising a second non-linear function of a decoding layer weight of the input and a decoding layer bias thereof;

receiving the input for the auto-encoder, wherein the input comprises a document comprising the machine printed text and the handwritten text;

performing an encoding on the input using an auto-encoder to generate a classifier;

applying the classifier on the input; and

generating an output that classifies the machine printed text and the handwritten text in the input based on the classifier in accordance with the perspective.

(実施例)

FIG. 1 illustrates an example system 100 of the present disclosure. The system 100 may include an input 102, a deep learning machine 106, an output or a classified input 108 and an optical character recognition (OCR) reader or intelligent character recognition (ICR) reader 114. The input 102 may be a document that has an unknown mixture of text 104.

The deep learning machine 106 may encode the input 102 and generate classifiers that can be applied to the input 102. The deep learning machine 106 may then generate a classified input or output 108 that classifies the machine printed text 116 and the handwritten text 112 in the input 102. The output 108 may then be forwarded to the OCR/ICR reader 114 for automatic processing (e.g., scanning and reading the text using an appropriate character reader based on machine printed text or handwritten text).

As shown in FIG. 2, the deep learning machine 106 may include a plurality of different processing layers. The processing layers may include an input layer 202, an auto-encoder layer 204, a classifier layer 206 and an output layer or layers 208 and/or 210. For example, based on a selected perspective that defines how the

deep learning machine 106 will process the input 102, the deep learning machine 106 may have a single output layer 208 or two output layers 208 and 210. The input layer 202 may receive the input 102 and extract the connected components from the input 102.

The auto encoder may be considered a one-hidden-layer neural network and its objective is to reconstruct the input 102 using its hidden representations or activations so that the reconstruction error is as small as possible. The auto-encoder takes the input 102 and puts the input 102 through an encoding function to get the encoding of the input 102 and then the auto-encoder decodes the encoding through a decoding function to recover an approximation of the original input 102. The auto-encoder layer 204 may apply a backward propagation algorithm to perform the above process and to generate the classifiers in the classifier layer 206.

The auto-encoder may be used to generate the classifier layer 206. The classifier layer 206 may be used to classify each text as machine printed text or handwritten text. The labels may be applied to each location of the sliding window as it moves along within the input 102. This process may be repeated until all the contents within the input 102 have been classified as a machine printed text or a handwritten text.

The deep learning machine 106 may then generate a single output layer 208 or two output layers 208 and 210 depending on a perspective that is selected for the auto-encoder. The perspectives may include an inpainting perspective or a classification perspective. The inpainting perspective may require generating a separate classification model within the deep learning machine 106 for the machine printed text and the handwritten text, thus, creating two output layers 208 and 210.

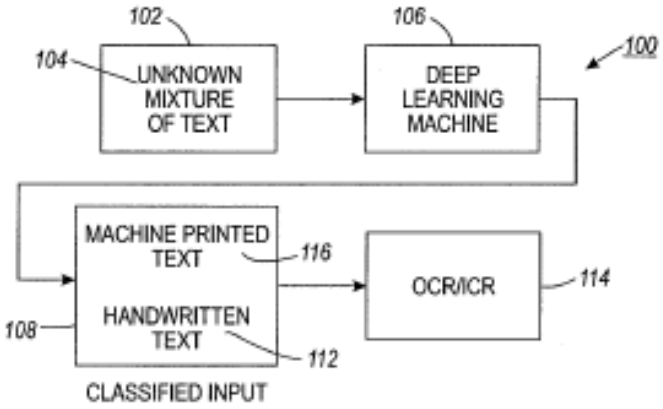
102
104
UNKNOWN MIXTURE OF TEXT
106
DEEP LEARNING MACHINE
100
MACHINE PRINTED TEXT
116
HANDWRITTEN TEXT
112
108
OCR/ICR
114
CLASSIFIED INPUT

FIG. 1

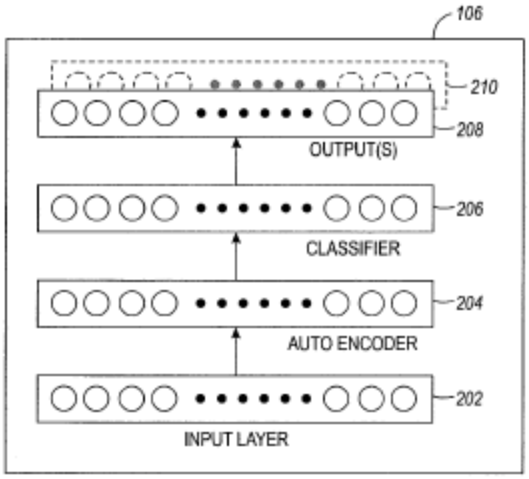
106
210
208
OUTPUT(S)
206
CLASSIFIER
204
AUTO ENCODER
202
INPUT LAYER

FIG. 2