REF ID:A60538

Op-20-S-5 (LFS/ef)
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11 November 1943

MEMORANDUM FOR COMMANDER J. J. FITZGERALD (OFFICE OF J.A.G.)

Subj: Electric Ciphering Machines - Patent situation with regard thereto.

Ref: (a) J.A.G. Conf. ltr. to SecNav dated 30 September 1932, and references therein.
(b) Hebern Patent #1,861,857 dated 7 June 1932.
(c) Damm Patent #1,502,376 dated 22 July 1924.
(d) Lemmon and Holt Patent #2,116,683 dated 10 May 1938.
(e) Noll Patent #2,116,731 dated 10 May 1938.
(f) CSPs 903, 1127, 1136, 1600, 1700.
(g) CSPs 904, 1128, 1354, 1601, 1701. (Descriptions of Ref. (f).)

Encl: (A) Copies of references (b), (c), (d), (e), and (g).

1. Reference (a) gave the opinion that the "Anderson-Seiler" cipher machine, which was the basis of the Mark I ECM, did not infringe on Hebern patents or on other patents for cipher machines.

2. Later cipher machines, invented and used by the U.S. Navy since 1936, are much different in certain respects from the "Anderson-Seiler" machine and possibly conflict with these patents, particularly reference (b) (Claims 46, 47, 48, 53, 54, 55, and 61). Three other patents, not listed in reference (a), have possible application or might be cited in infringement suits, namely, references (c), (d), and (e).

3. My analysis, based on my familiarity with numerous models of the Hebern Cipher Machine and our own machines, is given below. I probably have missed many legal implications, but do feel qualified as to the construction and action of these machines. This memorandum is submitted in order to commence an unofficial approach to the subject and as a basis of discussion. I expect to follow up at some later period with a request for patents on reference (f) and for opinions as to possibility of their infringing on existing patents.

4. Reference (c) is important for two reasons, namely:

I. It antedates ~~reference (b)~~ Hebern Patent # 1,510,444 by a matter of two months. 8 years
II. The unofficial claim has been made by Mr. William F. Friedman, of Signal Corps Headquarters, that the Damm "collectors" described therein perform the same function as the Hebern "code wheel" and, therefore, the Damm patent invalidates the Hebern patents.

My own opinion is that the Damm machine is entirely different from the Hebern machine with respect to claims, description, and cryptographic principles involved.

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5. References (d) and (e) are incorporated in an experimental cipher machine built by the International Business Machines Corporation. The claims of these references cover a "(manually operable) primary machine and a secondary machine operable from the first." This clears us entirely from infringements by our machines, which do not comprise a "primary machine and secondary machine operable from the first." It is conceivable, however, that our use of tandem operation (for check decipherment) in the ECM and CCM is an infringement. The "secondary machine" for check decipherment is an optional feature, and most of our ships and stations do not employ it because they only have one machine. If this point is thoroughly covered in the patent applications for the Mark II ECM, our other machines will be cleared automatically.

6. Reference (b) (Hebern Patent #1,861,857) has one group of claims which are possibly applicable to the Mark II ECM, the modified Mark I ECM, and the CCM. These claims (Nos. 46, 47, 48, and 61) cover automatic word spacing, which was not incorporated in the "Anderson-Seiler" machine on which the opinions of reference (a) were based. Automatic word spacing was added as a Navy alteration in 1939. Hebern's patent thus antedates our invention by a matter of seven years, so our only clearance can come in the wording of Hebern's claims, namely:

Claim #46.

(a) "Code and Decoding Machine" named in this claim means the double-printer machine previously described in this patent or the "primary machine and secondary machine" claimed in Lemmon #2,116,683 - and does not apply to any Navy machines, which have only one printer.

(b) "Complete and corresponding effect to that produced by the actuation of other of said (code-symbol) selectors" does not describe the action of the space-bar of the Navy machines. Our space-bar is inactive on Decipher (even if manually depressed) and, therefore, does not have the "complete and corresponding effect of other code-symbol selectors," which are active on Decipher as well as Encipher.

Claim #47.

(a) Same as (a) of Claim #46.

(b) "Adjustable means for connecting space-bar to any one of a plurality of code-symbol selectors" does not apply to the Navy machines, wherein the space-bar is invariably connected to the same code symbol selector.

Claim #48.

(a) "Attachment" is not applicable to the Navy machines, wherein the "automatic word-spacer" circuits are integral parts.

(b) "Incapacitate a character" does not apply to Navy machines, wherein the word-space circuit actuates the space magnet (of the Mark I ECM) or "print hammer suppressor magnet" (of the Mark II ECM).

(c) "Applied to any one of a plurality of designators," does not apply to the Navy machines, which have only one "word-space designator."

Claim #61.

(a) "Machine arranged to produce and print coded and decoded messages" does not apply to the Navy machines, which have only a single printer.

(b) "Automatically operative" does not describe the Navy machines, in which:

(1) "Controller" must be manually set to "Encipher" or "Plain" because the space-bar is inoperative at other positions of the "controller," and

(2) Space-bar must be manually depressed to be operative.

7. Hebern Patent #1,861,857 covers cam control of code-wheel stepping which is also used in CSPs 903, 1127, 1136, 1600, and 1700, and their associated code wheels. Claims #53, 54, and 55 come close to these Navy machines, but the wording of the patent apparently clears us of infringement. Hebern Patent #1,861,857 names and distinguishes three types of cams (or cam means) in the claims, namely:

(a) "Cam means adapted to revolve with ---- code wheel" - Claims #9-24 and Claim #53.

(b) "Code wheels having cam profiles associated therewith" - Claims #29-30 and Claims #54-55.

(c) "Code wheels having cam profiles formed thereon" - Claims #25-28.

The code wheels used with the mechanically controlled Navy machines very definitely have "cam profiles formed thereon," thus clearing us from the claims listed under (a) and (b), above, and specifically clearing us from claims #53, 54, and 55 which have no other apparent dissimilarity from the Navy machines. The claims under (c), above (#25-28) are cleared by other details of these claims, namely: "Controlling means ---- for incapacitating certain ratchet dogs at certain times." Our controlling means engages (i.e. capacitates) certain ratchet dogs at certain times. Further details of reference (f) may be found in reference (g).

8. It is requested that enclosure (A) be returned when no longer required.

L. F. Safford
Captain, U.S. Navy.